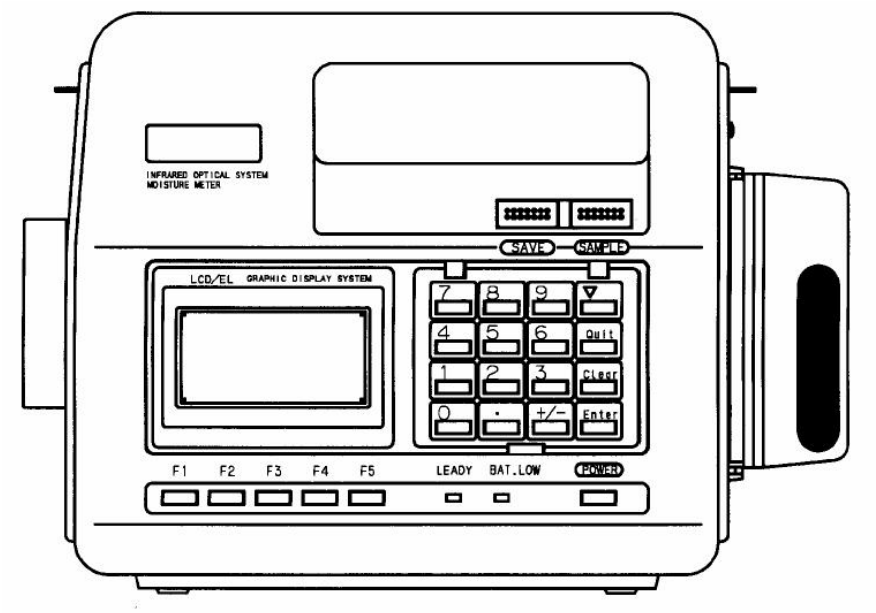
NEAR-INFRARED RAY REFLECTANCE METER [HAND-HELD TYPE]

JE-140 Analyzer
JE-130 Moisture Meter

User's Manual



Please read this manual thoroughly to use the instrument properly.

Keep this manual at hand for reference.

Ver. 0502-1.00

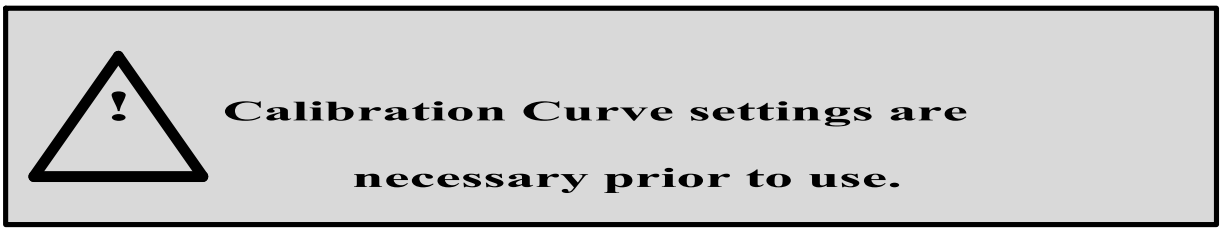
Preface

Thank you for purchasing our product, JE-140 Near-Infrared Analyzer.

Please read this manual thoroughly to make best use of it.

The objective of the analyzer

This analyzer applies Near-Infrared technology, which enables you to measure the sample component instantly and continuously. The analyzer calculates the components density of the sample in proportion to absorbance of near-infrared light.



Read this manual to set a proper analytical curve for the sample you are going to measure.

How to read this manual for JE-130

This manual is written for JE-140. However you can read it as JE-130 Manual. For JE-30, read the following two words as below:

JE-140 → JE-130

Component → Moisture

Additional articles are put in this manual where JE-140 and JE-130 differs and explanations are necessary.

SAFETY ISSUES

About Graphic Symbols: To prevent damages or harms due to incorrect operations of the instrument, this manual contains various graphic symbols. Do not use the instrument without understanding the contents of this manual. The symbols for safety issues are as follows.

WARNING May leads fatal or serious injury if the contents disregarded.

CAUTION May be harmful if the contents disregarded.

Example

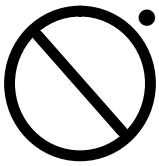
I ndicates contents include warning or caution.

Inside the triangle the specific matter is shown. i.g. Electric shock.

○Indicates prohibited actions for safety reasons.

WARNING

On Installation



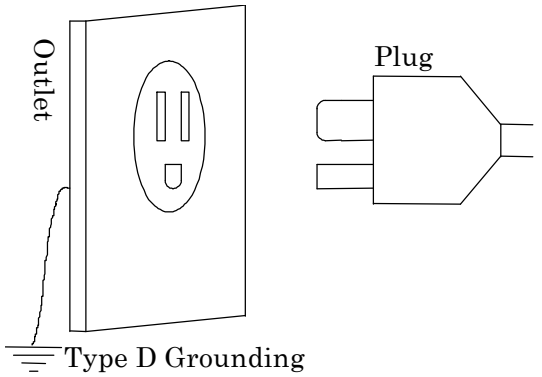
- Never use the instrument in places where explosive or inflammable gas, liquid or solid materials exist.
  May cause explosion, fire or electric shock if the instrument used in such environment.

SAFETY ISSUES

WARNING

On Wiring

- Use only the supplied power cable for the power outlet with the grounding terminal. Insert the plug firmly. May cause fire, electric shock or other accidents if the grounding is inappropriate.

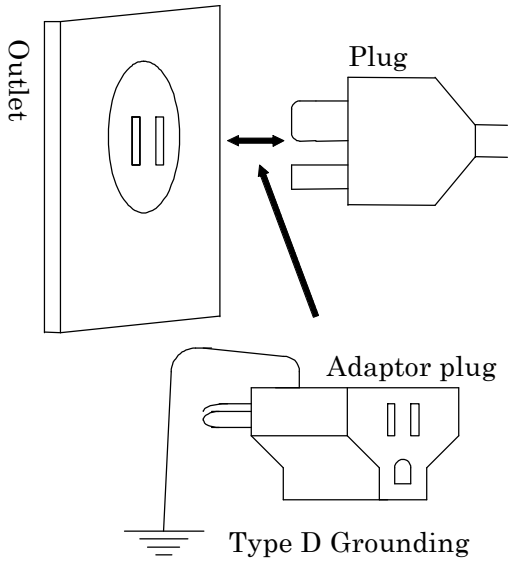


- Do not handle the plug and the inlet with wet hands. It may cause electric accidents.

- Do not damage or modify the power cable. It may cause fire or electric shock.

On Wiring (continued)

- When using an outlet with no grounding terminal, the transformation adaptor plug and the proper grounding work are required.
  May cause fire, electric shock or other accidents if the grounding is inappropriate.



- Do not heat up or stretch the power cable nor put heavy materials on.
  It may cause fire or electric shock.

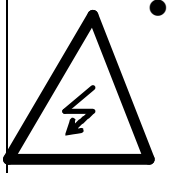
SAFETY ISSUES

WARNING

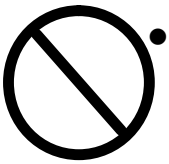
On Wiring (continued)

- When connecting the instrument with other devices, turn off the power of both the instrument and the devices to ensure no floating voltages exist.
  May cause electric shock or other accidents if they are connected to the outlet.

On Measurement



- If smoke and/or abnormal smell is observed, stop using the instrument immediately and remove the power plug from the outlet.
  Confirm the smoke is ceased and call the dealer for repair.
  Never attempt to repair it by yourself.



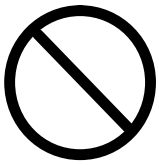
- Do not heat up or stretch the power cable nor put heavy materials on. It may cause fire or electric shock.

- Do not look in to the light source. It may harm your eyes.

On Maintenance

- When in maintenance, remove the power plug from the outlet. May cause electric shock if the plug is not removed.

- When exchanging the electric bulb or the fuse, remove the power cable from the analyzer. May cause electric shock and accidents if it is not removed.



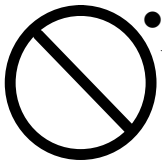
- Do not attempt to open the instrument except for exchanging the electric lamp or the fuse.
  May cause fire, electric shock or accidents if inappropriate work is attempted on the instrument.

SAFETY ISSUES

WARNING

On Uninstallation

- When uninstalling the instrument, remove the power cable from the analyzer. Confirm all the external control device connections have been removed. May cause electric shock if they are not removed.



- Do not handle the plug and inlet with wet hands. It may cause electric shock.

- If the power cable is observed as damaged, (i.e. exposing lead wire, cut, etc.) contact the dealer for exchange.
  Do not leave the damaged power plug in use. It may cause fire, electric shock or other accidents.

SAFETY ISSUES

WARNING

On Installation

- Do not install the instrument in following environment:

1. Ambient temperature over 40 C (104F).
2. Places exposed to direct sun light or wind and rain.

- Use the instrument in stable and static place. May cause accidental falls and fire if not used in such place.

- Using the instrument in dusty or corrosive gas generating places may occur troubles.
  Consult with your dealer if installing in such environment is inevitable.

On Wiring

- When removing the power plug or the connector cable, grab the plug or the connector to remove. Do not pull the cable or the connection wire.

On Measurement

- Produce Calibration Curve correctly for each measurement sample. Incorrect calibrations may affect your measurement.

- Do not look into the lamp. It may harm your eyes.

- If an error has occurred, immediately separate the instrument from your system. Leaving the instrument in use with an error may affect your system.

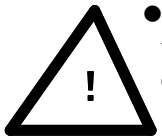
SAFETY ISSUE

WARNING

On Maintenance

- When exchanging the electric lamp, allow 30 minutes after the power plug has been removed. May cause burn if touched earlier.
- It is recommended for the instrument to receive service once in every other year.

Restart after a long off time



- When using the instrument after more than 6 months off, it is recommended to call the dealer for checking.

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1. JE-140 Overview

1.1 General Information

Before using JE-140, Please confirm the components in the package. Also please read the short article on the principle of measurement for using the analyzer properly.

JE-140 is a precision instrument. Follow the precautions below:

1) Be sure to use only the supplied battery pack or the AC adaptor.

2) The battery pack is uncharged. Charge up before using it.

3) Never give a physical impact on the instrument body. Do not drop it.

4) When using the instrument on the stand, install it on a level and static place.

5) Use in the ambient temperature 10~ 40 C (50~104F) without condensation.

6) Do not use under heavily dusty conditions.

7) Clean the instrument and the zero adjustment plate with a soft cloth to remove dust and foreign objects. Do no use alcohol or other solvents.

8) Although every component of our AC 100 V instruments complies Japanese laws governing the safety of electrical products, it is nonetheless necessary to ensure that the ground terminals of the analyzer is properly connected to prevent possible shock hazards.

9) For AC 100V instrument, the power source is AC 100V 50/60 Hz. Do not use under other electric conditions.

Never disassemble the instrument except for exchanging the bulb. The optical system is precisely adjusted at the time of shipping. Damages incurred as the result of unnecessary disassembly is excluded from warranty coverage.

Do not use the analyze near flammable or explosive materials.

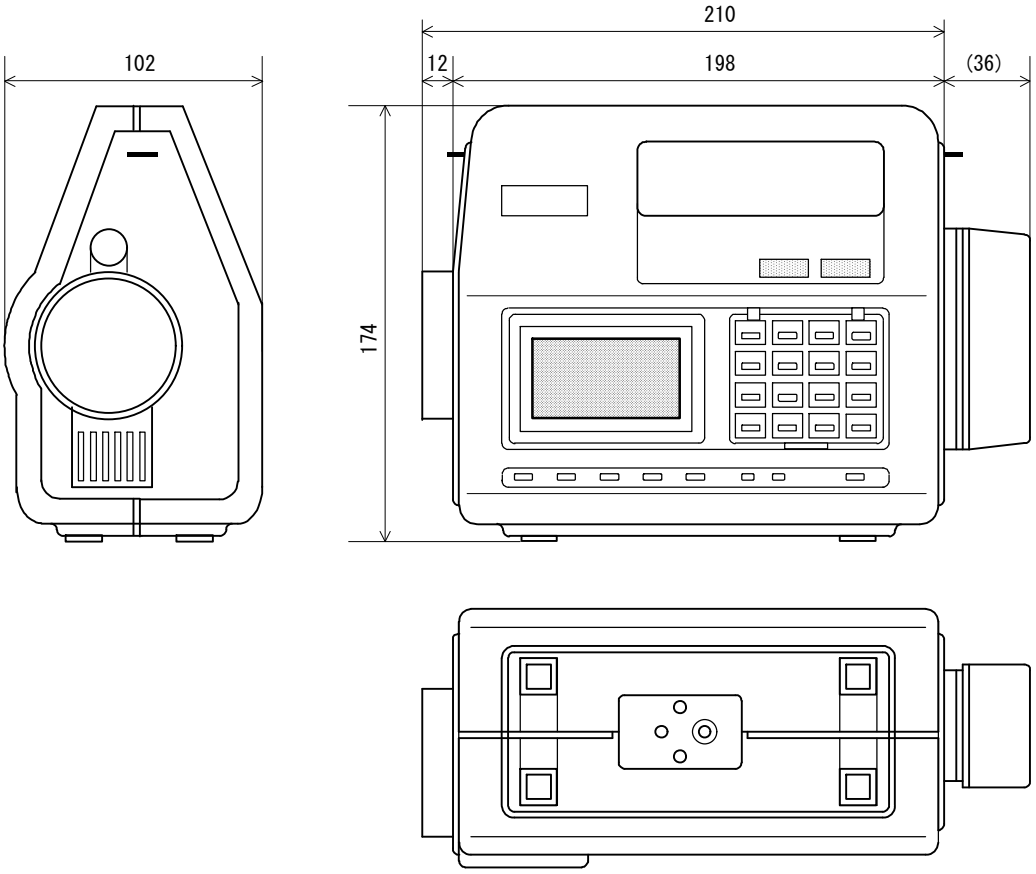
1.2 Battery Pack Precautions

1) The battery is shipped uncharged. Fully charge the battery pack before using the analyzer.
   - Read “On using the battery pack chrger” (3) and 4.2 (1).
   - Use the supplied battery charger only and do not use other charging equipment.
2) Do not let metal objects touch the metal terminals of the battery for avoiding malfunctions or accidents.
   - When at transporting or storage, always put the battery in the supplied battery case for safety.
   - When the analyzer runs for shorter time than usual on a fully charged battery pack, the battery life is running short. Purchase a new battery pack.
   - Never keep the battery pack near a sauce of heat or fire. Do not dispose it in fire.
   - Never disassemble nor rework the battery pack.
   - Do not spill water on the battery pack.
   - Never give a physical impact nor drop the battery pack.
   - Always keep the terminals clean.
   - The battery pack may get warm after charging or after using the analyzer. This, however will not affect the performance of the battery pack.
   - The battery pack will provide less running time in colder areas.
3) On using the battery pack charger:
   - Full charging of a battery pack (NP-90) takes about 3hours 15minites.
   - Use the power supply AC100V ~ 240V, 50~60Hz.
   - Never let other metals touch the battery pack charger terminals.
   - Never disassemble nor rework the charger.
   - Never give a physical impact nor drop the charger.
   - Always keep the terminals clean.
   - When refreshing the battery pack with the charger, the AC power adaptor gets warm as it consume electric power inside it. Put to use the charger in a good ventilated environment.

1.3 Verifying the Analyzer and Accessories

In the package, the JE-140 body is packed in the cushion material. Accessories and documents are enclosed around the JE-140 body. Take out the documents and accessories first and gently unpack the package.

1) JE-140 Body

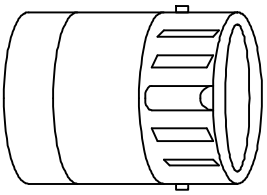


JE-140 Overview

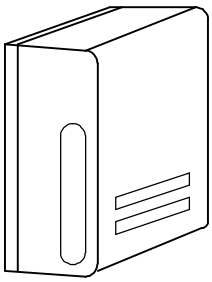
2) JE-140 Standard accessories

Accessories in the carrying case:

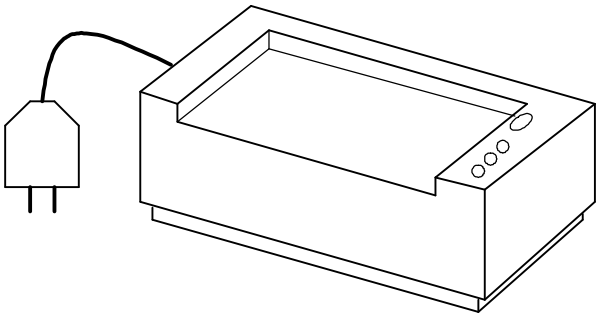
Zero Adjustment Hood, Qty: 1

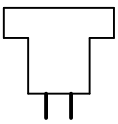


Battery Pack, Qty: 2



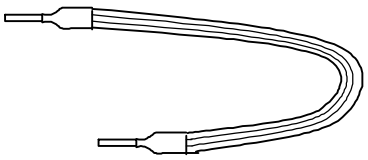
Battery Charger, Qty: 1



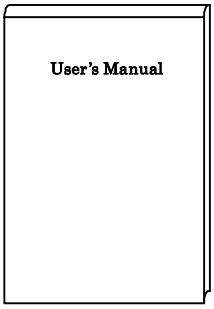


(Plug Adaptor, Qty: 1)

Strap, Qty: 1



User's Manual



3) JE-140 Documents:

1) User's manual, Qty: One

2) Warranty, Qty: One

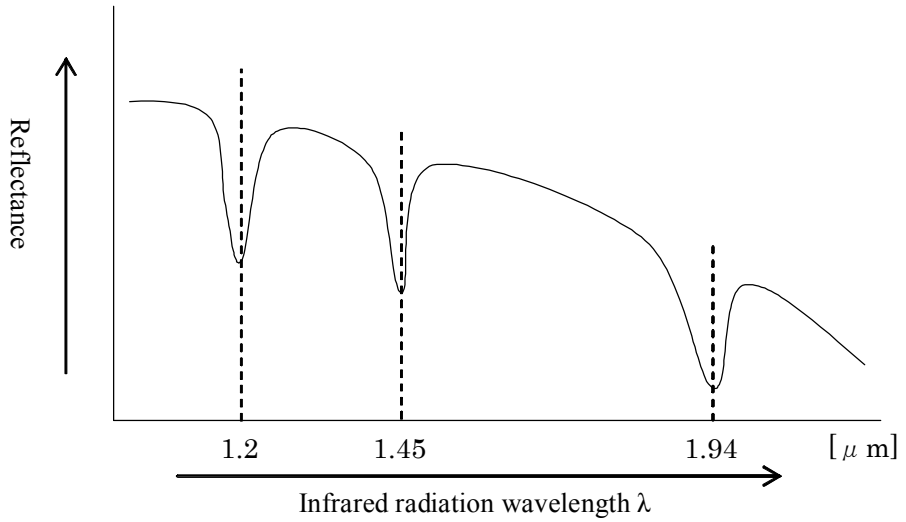
2. Principle of Near-Infrared Ray Measurement

JE-140 is an NIR analyzer. It's measurement principle is completely different from conventional methods such as Karl Fischer or the drying method.

2.1 Measurement Principle

Components of a sample have their specific absorbance wavelength band in near-infrared spectrum area. When a sample is irradiated with light of these wavelengths it will absorb this light in an amount proportional to its content. The quantity of the component can be detected by measuring the light attenuation.

For example, water has its absorbance band in 1.2, 1.4 and 1.95 μm. When a sample is irradiated with light of these wavelengths, it will absorb this light in an amount proportional to its moisture content. However, measurement using only the absorption wavelengths can produce inaccurate results because of extraneous factors such as surface condition, particle size and color of the sample. To eliminate these factors this analyzer employs a method which uses an additional near-infrared light or "reference wavelength" that is not easily absorbed by water. This analyzer irradiates the sample with the both the absorption wavelengths AND the reference wavelength. It then compares the reflectivity of light of both wavelengths, arriving at a ratio which is then converted into a moisture content value.



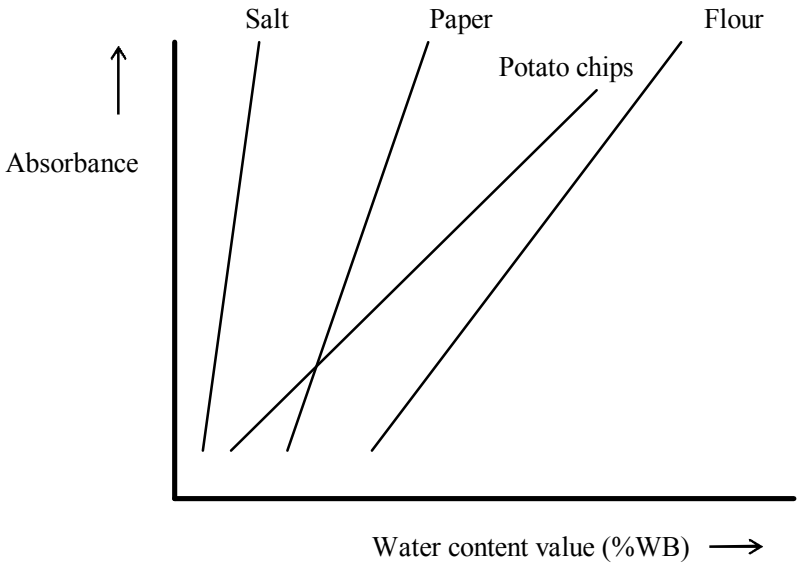
Spectral Reflectance of Water

2.2 Calibration (Analytical Curve)

2.2.1 Necessity of Calibration

JE-140 converts the near-infrared absorption measurement into component value. This requires that expressions be used to measure real moisture according to the degree of infrared absorption. This expression of calibration is called Calibration Curve or Analytical Curve. It will differ for each sample, making it necessary to construct the proper calibration prior to carrying out the measurement operation.

On JE-140, you can easily register the Calibration Curve. Read "Setting Analytical Curve" section in this manual for detail.

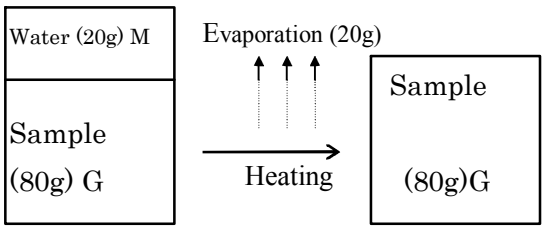


2.2.2 Display of Water Content Value

There are two methods known for expressing the quantity of water, the Dry–base and the Wet–base methods. Both express water content value in %.

Wet-base [%WB] ⟶ MX100/ (G + M) G: Weight of the sample after water is removed by drying.

Dry-base [%DB] ⟶ MX100/ G M: Quantity of evaporated water



$$\%WB = \frac{20}{80+20} \times 100 = 20\%$$

$$\%DB = \frac{20}{80} \times 100 = 25\%$$

[Reference] Expression

$$\%DB = \frac{\%WB \times 100}{100 - \%WB}$$ (Normally Wet–base is used.)

2.3 Features

JE-140 has following features:

1) In comparison with the Drying Method and Karl Fischer Method
   - Extremely short time measurement (approx. 6 seconds).
   - None destructive measurement enables the sample to feedback on the production line.
2) In comparison with other methods such as high frequency, micro wave and electric resistance method:
   - Minimal affection to the sample temperature.
   - Easy calibration
   - Accurate measurement
3) In comparison with other NIR analyzer/moisture meter
   - Light in weight, compact and portable.
   - Intuitive and easy operation

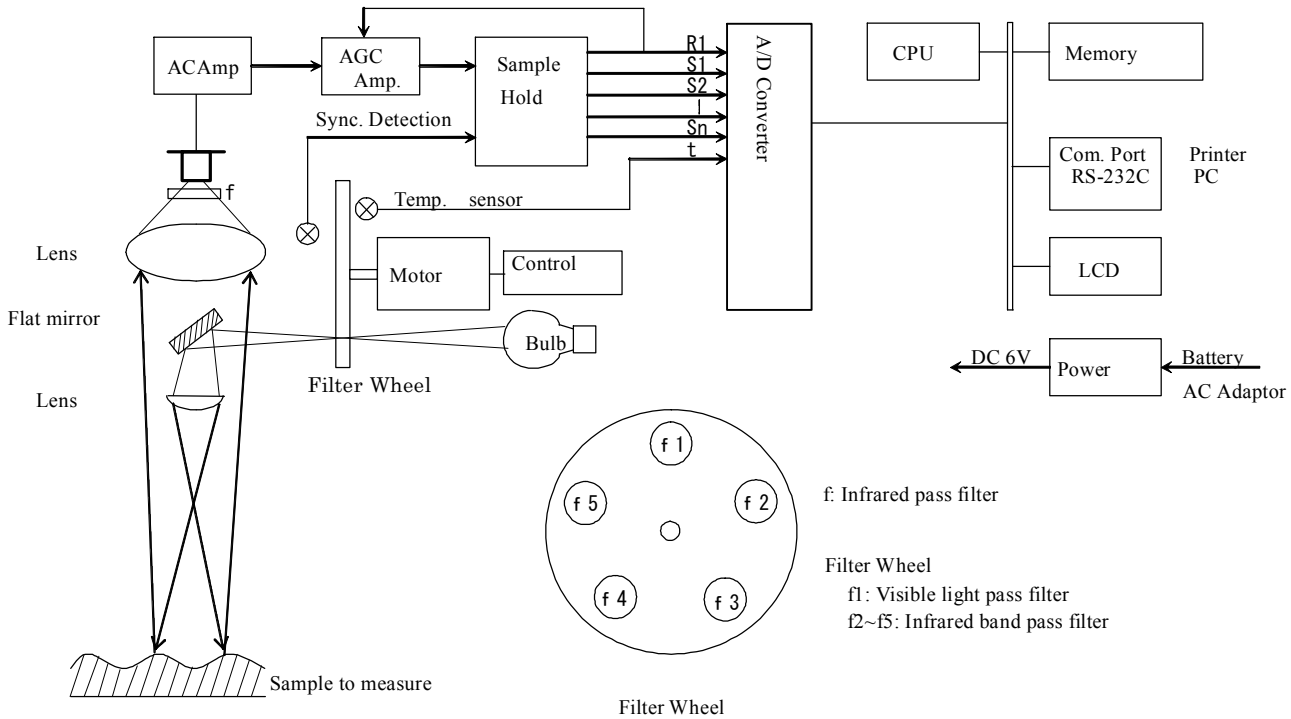
2.4 Notes on Measurement

Please pay attention to followings at measurement.

1) Keep the angle and distance unchanged at hand held measurement.

2) Choose the flat and smooth surface of the sample as possible. Rough surface affect the accuracy of the measurement.

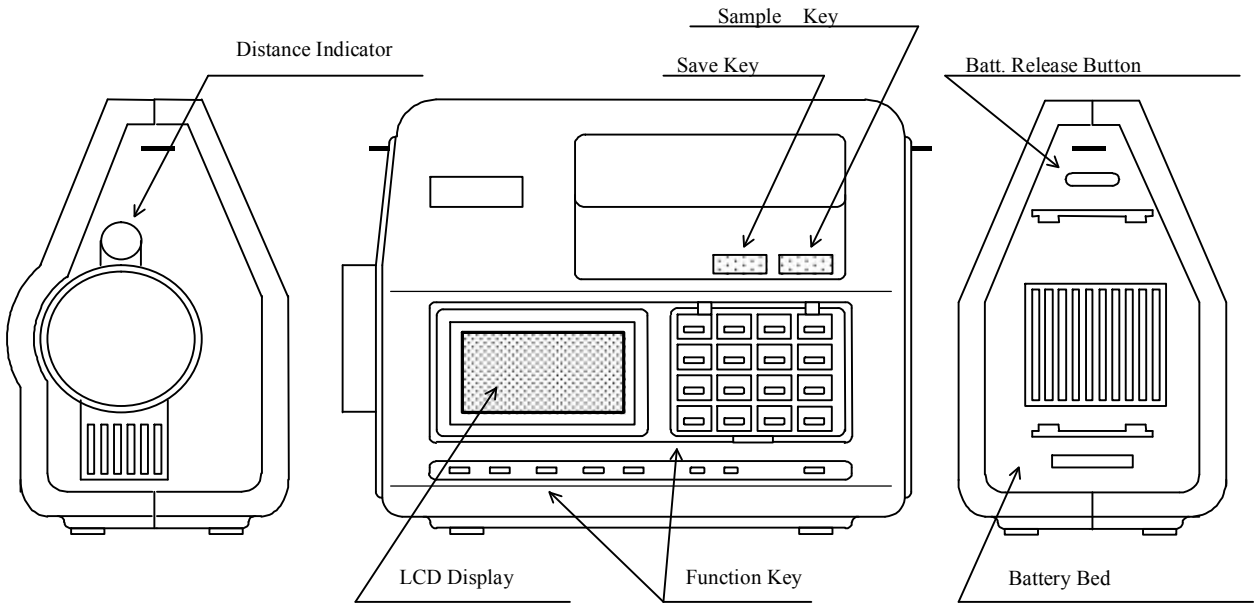
2.5 Mechanism



JE-140 Components

3. Nomenclature

3.1 Main Body



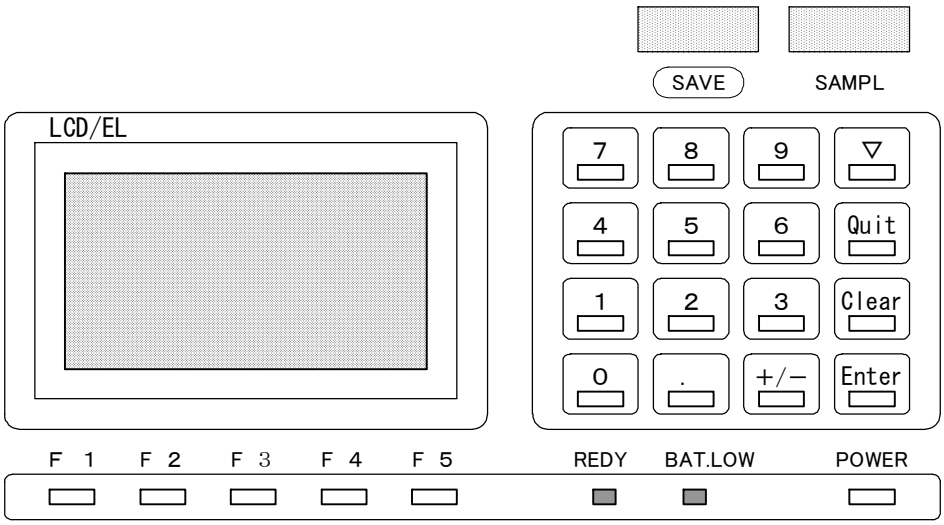
Front View

Control Panel

Rear View

JE-140

3.2 Control Panel



3.3 Functions of the Key Buttons

Key	Function
▽	To select menu item.
Ｑｕｉｔ	To go back.
Ｃｌｅａｒ	To delete the line that the cursor is on.
Ｅｎｔｅｒ	To enter numbers and enter the menu.
＋／－	To reverse ＋ and －.
.	To put decimal point.
０～９	Ten key To enter 0~9 numbers.
Ｆ１～Ｆ５	To select channel. Cannels can be set by the user.
ＳＡＶＥ	To save the component value and absorbance in the memory.
ＳＡＭＰＬＥ	To perform measurement while pressed down.
ＰＯＷＥＲ	Power switch

READY LAMP ————Indicates that the measurement is ready.

BATT. LOW LAMP ———Lit when the battery power is falling low.

Also a beep sounds with the lamp. Change the battery to continue the measurement.

4. Power Source

4.1 Two Types of Power

Two types power source is available for JE-140.

- Battery pack

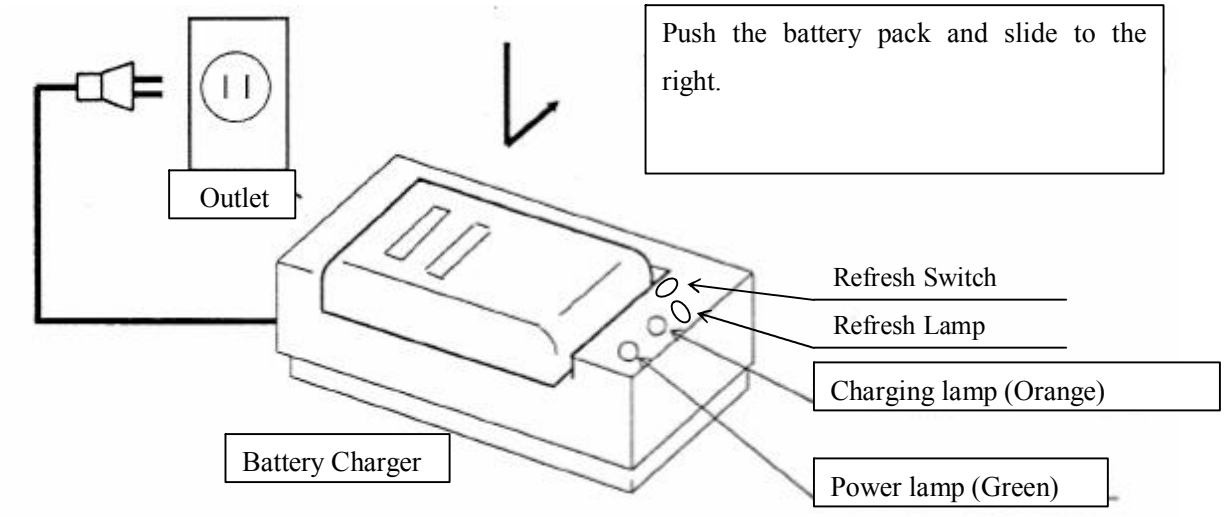
-AC adaptor

4.2 Battery Pack

1) Charging and refreshing should e done in a well ventilated room.

Charging one battery pack (NP-90) takes about 3hours and 15 minutes.

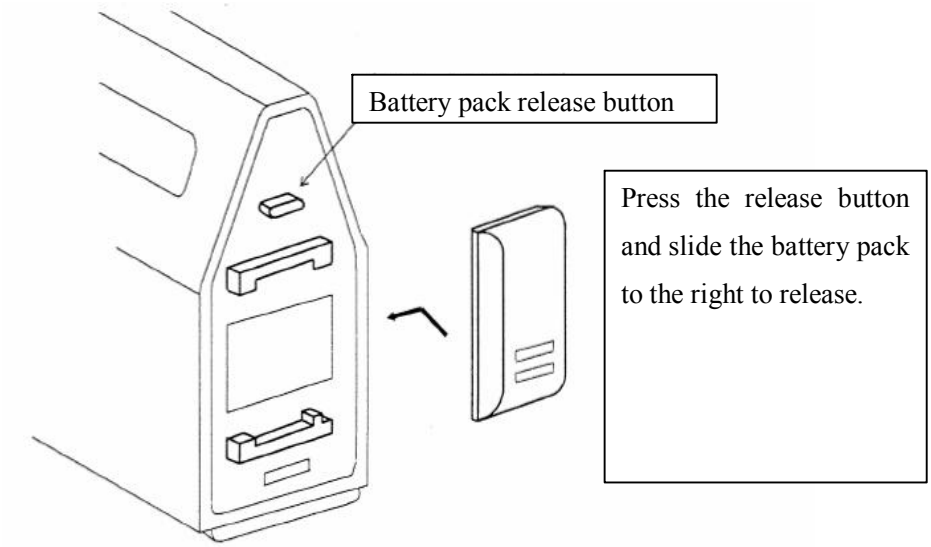
Refreshing time is about 10 hours and 15 minutes.



2) Mounting the Battery Pack

Push the battery pack and slide to the left.

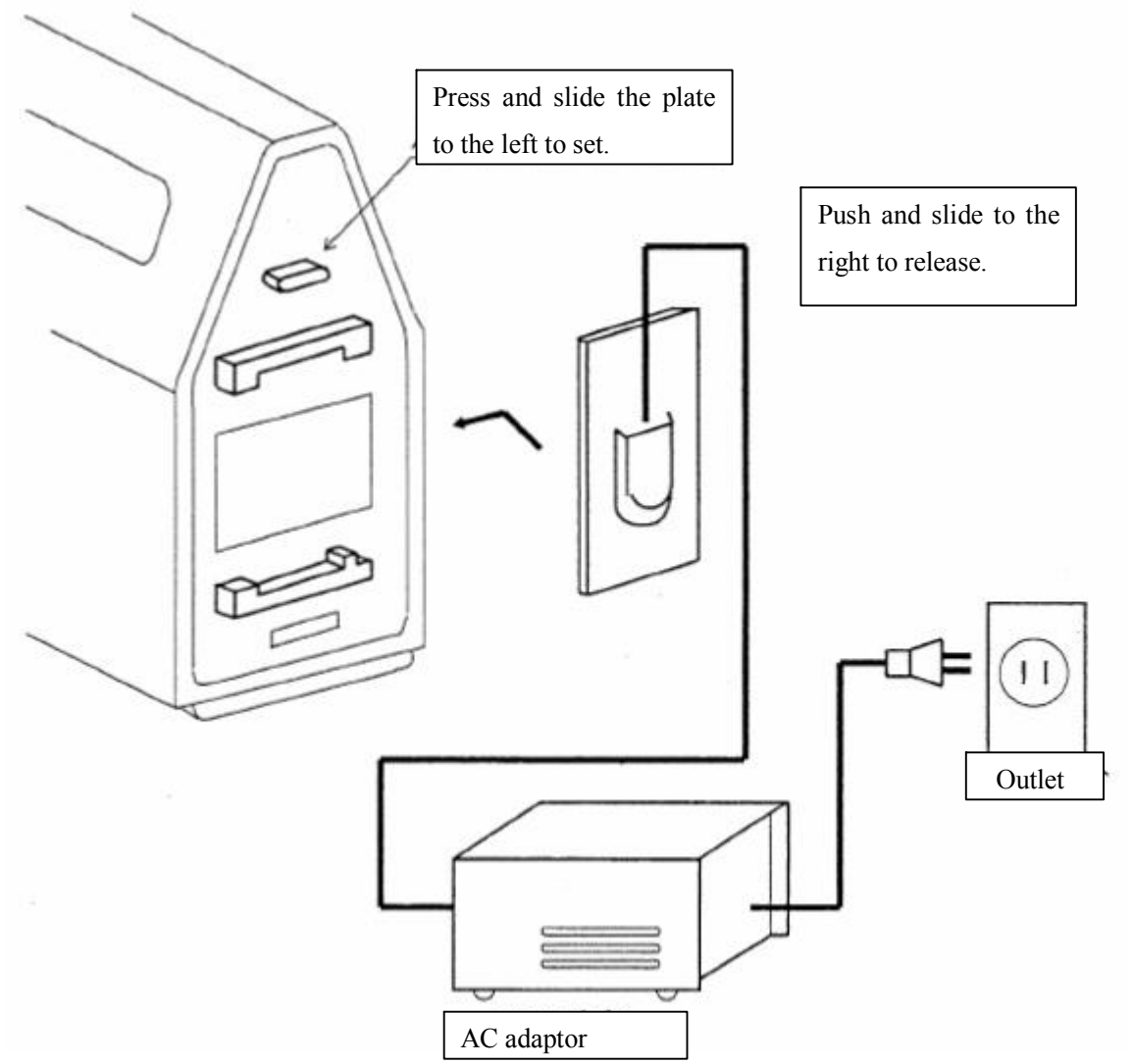
Press the release button and slide the battery pack to the right to release.



4.3 AC Adaptor (Optional)

1) In Japan, AC 100V 50/60Hz should be used for the adaptor. Else must not be used.

Press and slide the plate to the left to set.



2) Removing the adaptor

Press the battery release button and slide the plate to the right.

5. Automatic Zero Adjustment and Measurement Position

5.1 Automatic Zero Adjustment

How to set the hood:

1) Set the zero adjustment hood onto the analyzer body.

   Match the groove of the hood with the adjust guide of the analyzer body and press until you hear a clicking sound.

2) Turn the switching lever on the hood to "Z" position.

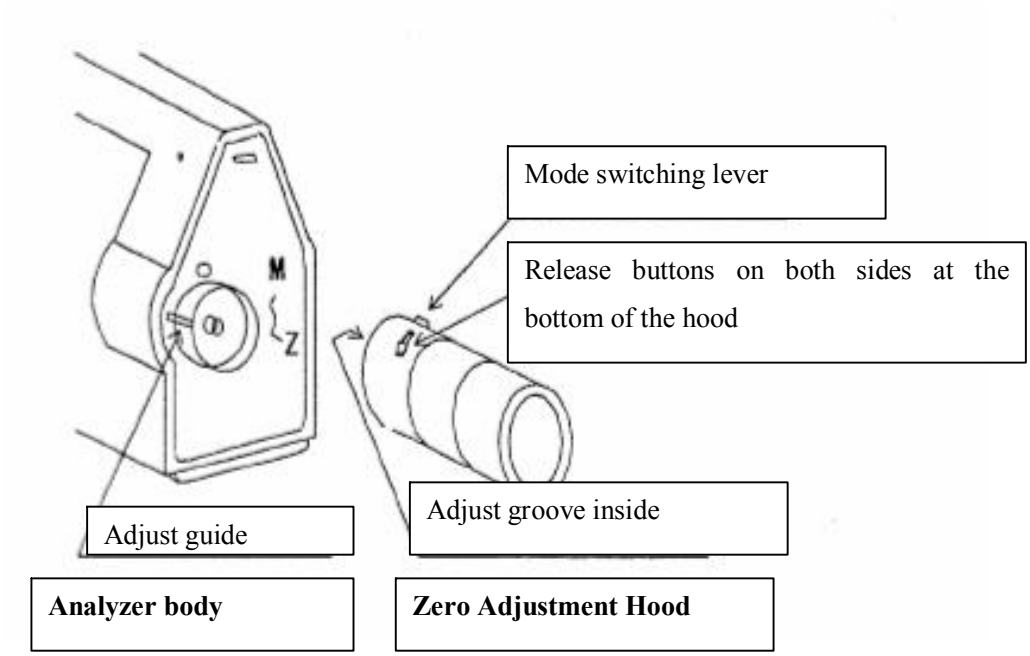
3) Press the POWER switch to turn the power on. "Beep" sound can be heard."

4) In a couple of minutes the REDY lamp will be lit and the zero adjustment is done.

5) Remove the hood from the analyzer.

   - Gently pull out the hood while pressing the releasing buttons on both sides on the bottom of the hood..

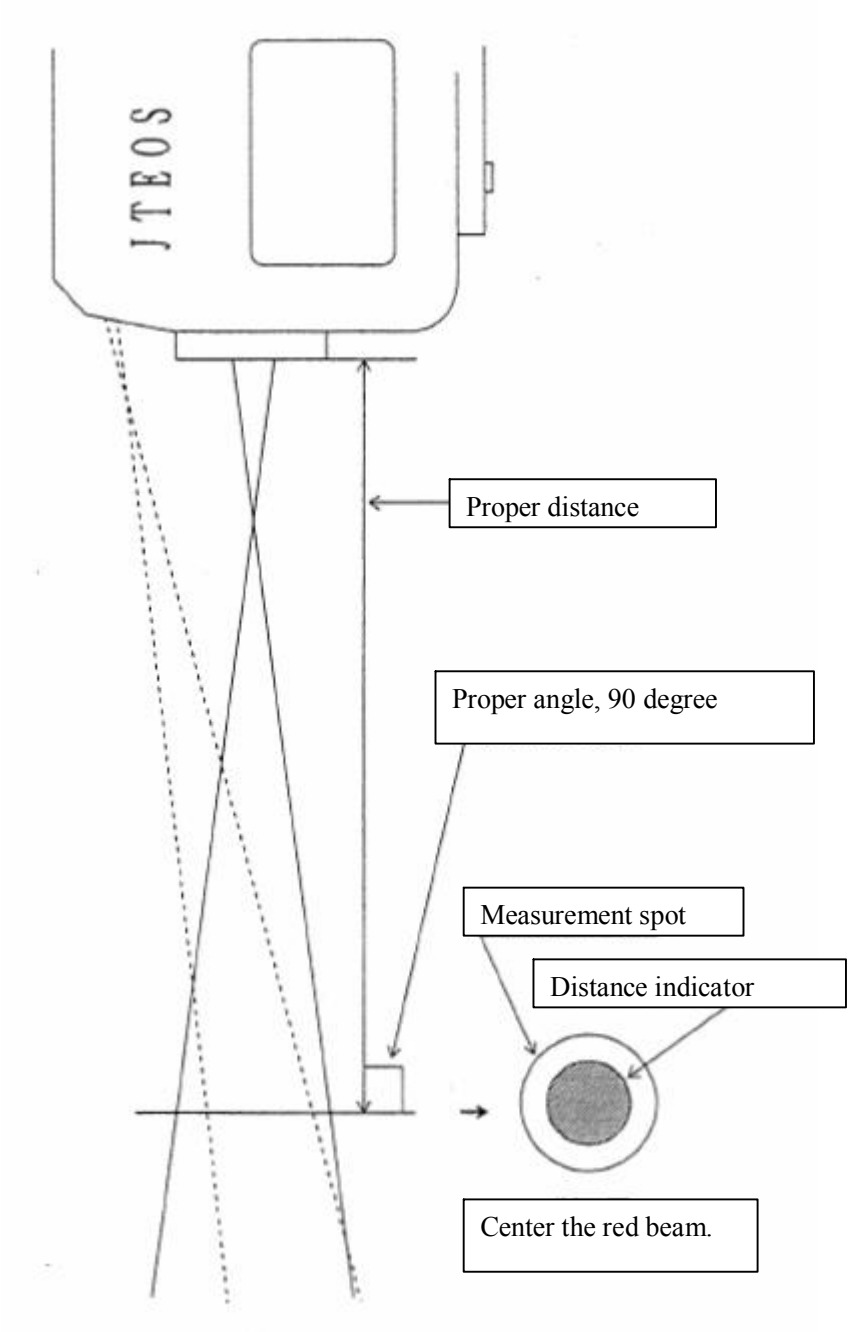
6) The analyzer is now ready for measurement.



5.2 How to Set the Measurement Position

Move the analyzer back and forth to center the red beam in the measurement spot light.

At this distance, the analyzer is properly positioned (150mm distance). We recommend holding the analyzer to face right angled (90 degree) to the surface of the sample.



6. Operation Menu

6.1 Functions to Select

Measurement functions and performance on JE-140 can be selected on LCD main menu and sub menu.

Main Menu	Sub Menu	Function
Moisture Measurement	Channel Selection	Selects measurement channel
	Smoothing	Sets smoothing level
	Display Item	Selects Component% or Absorbance, sets digits to display under the decimal point
	Name Register	Enters channel name
	Name List	Lists all the channel names
	Name All Clear	Initializes all the channel names
Calibration	Channel Selection	Selects calibration channel
	Data Input	Enters Absorbance and Component %
	Calculation	Calculates Analytical Curve coefficients
	Parameter Input	Enters Analytical Curve parameters
	Data All Clear	Initializes calibration data
Level Change		Changes menu levels with password
Save Data	Data Display	Displays saved data
	Data All Clear	Initializes saved data
RS232C Output	Save Data	Outputs saved data
	Channel Parameter	Outputs channel parameters
	Measurement Data	Outputs component % at a certain interval
	Channel Name	Outputs all the channel names
System Settings	LCD Contrast	Adjusts LCD contrast
	Date/Time	Sets date, time and auto-power off time
	RS-232C Setting	Sets communication specs
	Function Key Setting	Allocates channel numbers to F1~F5 key
	Measurement Mode Setting	Switches from/to sample measurement, continuous measurement and average measurement
	Remote Control	Sets PC connection On/Off
Maintenance	Password Setting	Sets password for menu level
	Output Check	Displays each wavelength output
	System Coefficient	Displays system coefficient (**Alternation Prohibited**)
	Temp. Compensation	Enters compensation mode
	Memory Clear	Initializes the system and channel parameters
	Zero Adjustment	Performs Zero adjustment with the Zero adjustment plate
	LANGUAGE	Switches display language from/to Japanese and English

All but "Password Setting" in the Maintenance where gray colored in the list above are for the manufacturer to control. **Never attempt to operate.**

6.2 Selecting the Menu Level

JE-140 has three levels of menu, 0, 1 & 2. When the power is turned on, the menu is on level 0. To enter level 2 and 3, select "Level Change" on Main Menu and enter password. You can always return from level 1 or 2 to level 0.

Level	Content	Password	Remarks
Level 0	User menu that only allows component measurement operations	Not required	For normal measurement operations.
Level 1	Level 0 + Analytical Curve (Calibration) mode	User's password required	For Calibration settings
Level 2	Level 1 + maintenance mode	9999	For setting user's password. **(Other operations prohibited.)**

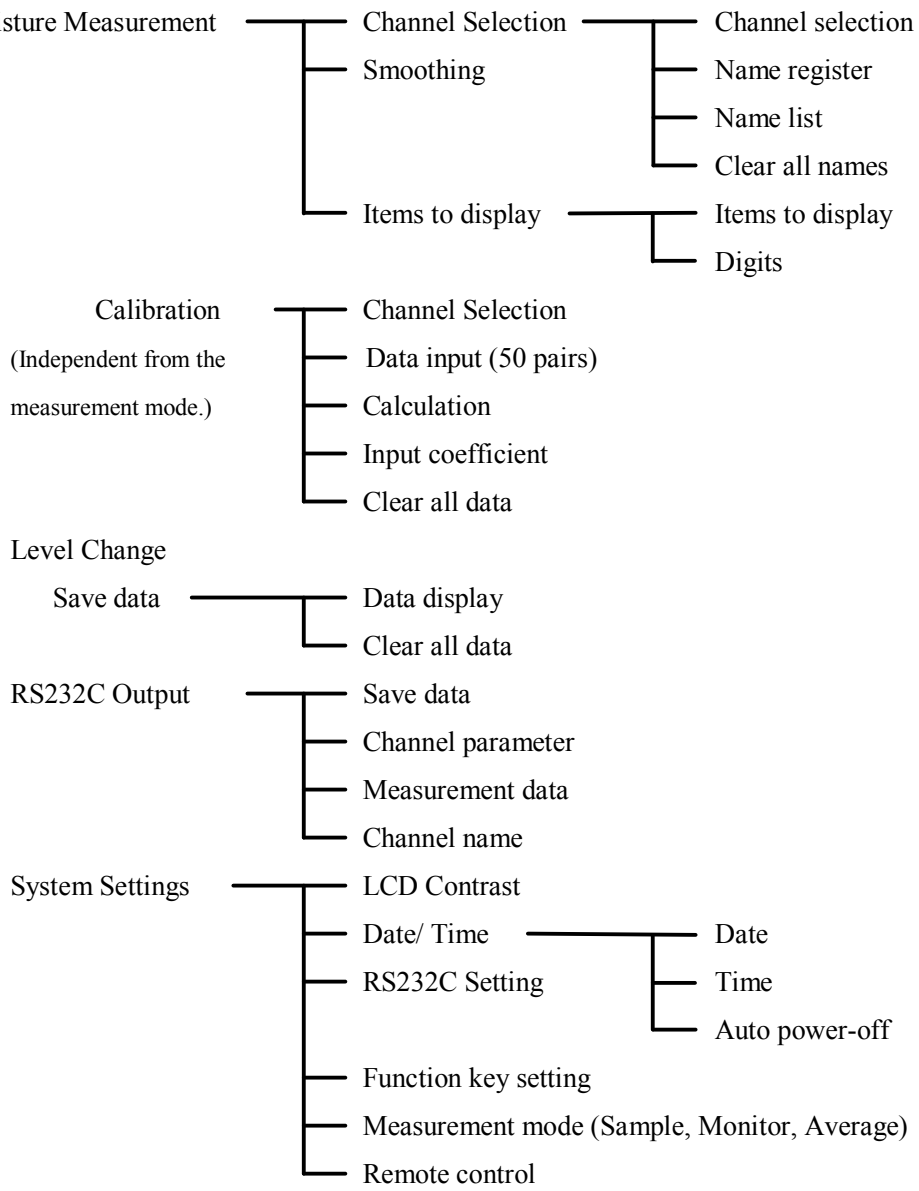
Do not operate other than setting user's password on Level 2, Maintenance menu where grayed in the list above.

6.3 Menu Constructions on Each Level

Operate for normal measurement.

1) Level 0 Moisture Measurement
   - Channel selection
   - Smoothing
   - Items to display
     - Item to display
     - Digits
   - Save data
     - Data display
     - Data all clear
   - RS232C Output
     - Save data
     - Channel parameter
     - Measurement data
     - Channel name
   - System Settings
     - LCD Contrast Level Change
     - Date/Time
       - Date
       - Time
       - Auto power-off
     - Measurement mode (Sample, Monitor, Average)

2) Level 1 Moisture Measurement



Use only for setting user's password.

- 3) Level 2 Moisture Measurement
  - Channel Selection
    - Channel selection
    - Name register
    - Name list
    - Clear all names
  - Smoothing
  - Items to display
    - Items to display
    - Digits
- Calibration (Independent from the measurement mode.)
  - Channel Selection
  - Data input (50 pairs)
  - Calculation
  - Input coefficient
  - Clear all data
- Level Change
- Save data
  - Data display
  - Clear all data
- RS232C Output
  - Save data
  - Channel parameter
  - Measurement data
  - Channel name
- System Settings
  - LCD Contrast
  - Date/ Time
    - Date
    - Time
    - Auto power-off
  - RS232C Setting
  - Function key setting
  - Measurement mode (Sample, Monitor, Average)
  - Remote control
  - Maintenance
    - **Password setting**
    - Output check
    - System coefficient
    - Temp. compensation
    - Clear memory
    - Zero adjustment
    - LANGUAGE

Do not enter the grayed area.

6.4 Setting Password for the Level 1 menu (Set at Level 2)

Set password to allow operations on level 1 menu. Once you have set it, you can use it for level 1 and for changing levels as well.

When you are setting user's password, you are about to go in the level 2 Maintenance Mode. Do not operate anything but password setting in Maintenance Mode.

Procedure	Operation	LCD	Remarks
1) Enter Level 2	Hit the "QUIT" key to call MAN MENU and select Change Level.	MAIN MENU COMPO. MEASURE ▽CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 0	
	Enter Level 2 password "99999" and hit the ENTER key.	PASSWORD CODE : 9 9 9 9 9 ROM : ******** MODE : 4	ROM:****** shows the ROM version # Note: "MODE: 3" indicates JE-130. "MODE: 4" for JE140
2) Select SET SYSTEM Mode	Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG.A,CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT ▽SET SYSTEM LEVEL : 2	
3) Select Maintenance Mode	Move the cursor over the Maintenance and hit the ENTER key.	SYSTEM SETTING LCD Contrast SET DATE/TIME SET RS232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL ▽MAINTENANCE	

Procedure	Operation	LCD	Remarks
4) Select password setting mode	Move the cursor over SET PASSWORD and hit the ENTER key.	MAINTENANCE ▽SET PASSWORD OUTPUT CHECK SYSTEM PARAM. TEMP. COMPENSE CLEAR MEMORY ZERO ADJUST LANGUAGE	
5) Set the password	Enter your password for the level 1 operation and hit the Enter key. i.g. To set "00025" for the password, press 2 and 5 and hit the ENTER key.	PASSWORD SETTING LEVEL CODE 1 00025	
6) Return to Component Measurement	Hit the QUIT key. Hit the QUIT key. Hit the QUIT key. Move the cursor over COMPO. MEASURE and hit the Enter key to return to Moist. Measurement display.	Returns to MAITENANCE. Returns to SYSTEM SETTING. Returns to MAINMENU. **MAIN MENU** ▽COMPO. MEASURE PROG. A. CURVE CHENGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 2	Level 2 is sustained until you turn off the power or change the level.

Note: Once you turn the power off, the analyzer will start form Level "0" next time.

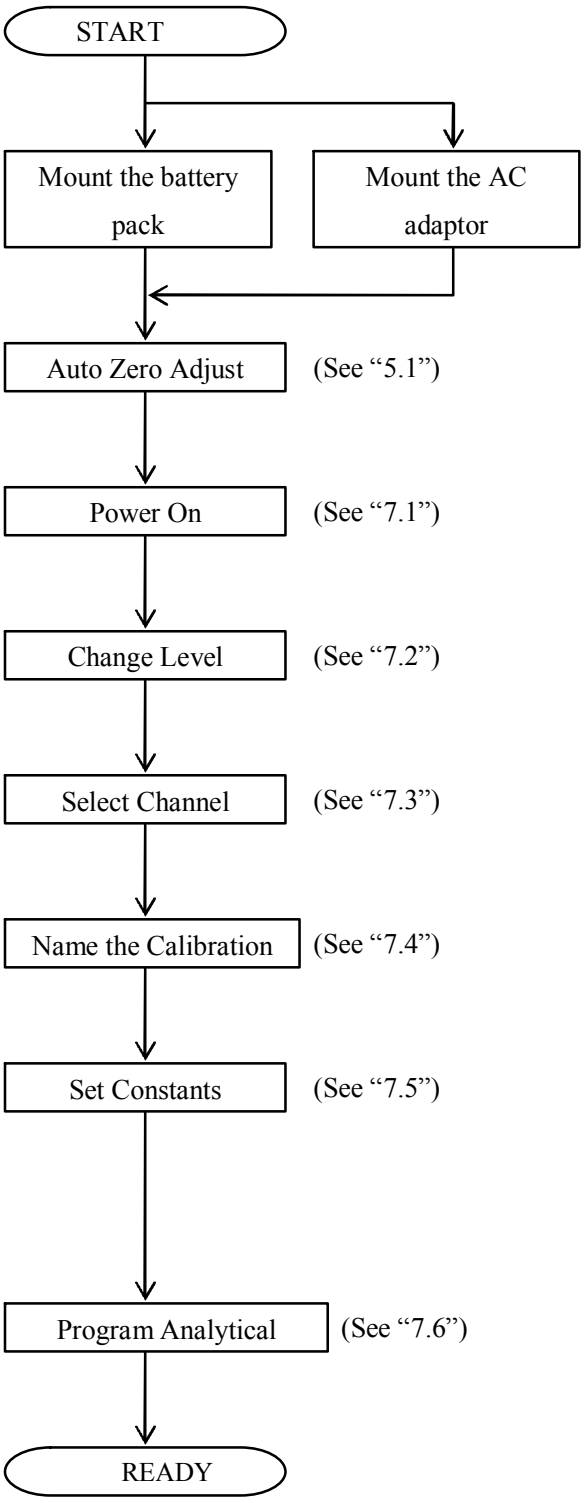
If you change the level without turning the power off:

Enter any number but "1" to change it to Level "0".

Enter the level 1 password to change it to Level "1".

Note: 99999 is a fixed, factory set password to enter Level "2" . You cannot change it.

7. Basic Operations and Settings


Operation
Remarks
START
Mount the battery pack
Mount the AC adaptor
Charge the battery pack before use unless you use the AC adaptor.
Auto Zero Adjust
(See "5.1")
Set the Zero Adjustment Hood and set the lever on the hood to "Z" position.
Power On
(See "7.1")
Turn the instrument power on.
A few minutes until the READY lamp lit.
Change Level
(See "7.2")
Enter Level "1" to set Analytical Curve.
Select Channel
(See "7.3")
Select the measurement channel for the sample.
Name the Calibration
(See "7.4")
Name the channel to identify the measurement.
Set Constants
(See "7.5")
Select "Smoothing" when the componet % display wavers.
Select under dicimal point digits to display. (0~2)
Program Analytical
(See "7.6")
Enter the absorbance and lab-tested component value data to set the Anaytical Curve.
READY
Now the settings are done and the analyzer is ready for the measurement.

7.1 Power On/Off

Press the POWER button on the instrument to turn the power on. Press again to turn off.

7.2 Changing the Level (from Level "0")

Procedure	Operation	LCD	Remarks
1) Call MAIN MENU	Hit the QUIT key.	MAIN MENU ▽CH 1 : SMOOTHING : 0 DISPLAY: (%) 12.34 00 Time: 10:10	
2) Select Change Level	Move the cursor over CHANGE LEVEL and hit the ENTER Key.	MAIN MENU COMPO. MEASURE ▽CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 0	
3)Enter Password	Enter your password for Level 1 and hit the ENTER key. i.g. 5.	PASSWORD CODE: 0 0 0 0 5 ROM: ********* MODE: 4	ROM:******* ROM version # Mode: 3 shows the instrument is JE-130 and 4 is JE-140
4) Return to Component Measurement	Move the cursor over COMPO.MEASURE and Hit the Enter key.	MAIN MENU ▽COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT SET SYSTEM LEVEL :1	Level 1 is sustained while the instrument power is on.

7.3 Channel Setting (Operations on Level "0")

Procedure	Operation	LCD	Remarks
1) Select the channel mode	Move the cursor over CH and hit the ENTER key.	COMPO. MEASURE ▽CH 1: SMOOTH: 0 DISP: (%) 12.34 00 TIME: 10:10	
2) Select the channel setting mode.	Move the cursor over CH and hit the ENTER key.	COMPO. MESURE ▽CH 1:	When operations on Level "1", there appears INPUT NAME as well on the LCD.
3) Set the channel	Input a number of the channel in the blinking area and hit the Enter key. i.g. 2 is assigned.	COMPO. MEASURE ▽CH 2 :	You can input 1~50, 50 channels.
4) Return to component measurement.	Hit the QUIT key.	COMPO. MESURE ▽CH 2: SMOOTH: 0 DISP: (%) 23.45 00 TIME: 10:10	If the A.Curve is not set yet in the channel you have selected, "CH NOT SET" Error message will appear.

Note: "00" on the lower left of the LCD shows the data numbers saved in the analyzer.

We recommend to aassign frequently used channel numbers to F keys (F1~F5) for quick change. See how to set them at 9.3 of this manual.

7.3 Naming the Analytical Curve

7.4.1 Assigning the Name (Operations on Level "1")

You can input 8 numeric and/or alphabet characters to name the measurement of each channel.

Procedure	Operation	LCD	Remarks
1) Select Channel Mode.	Move the cursor over CH and hit the ENTER key.	COMPO. MEASURE ▽CH 1: SMOOTH: 0 DISP: (%) 12.34 00 TIME: 10:10	
2) Select INPUT NAME	Move the cursor over INPUT NAME and hit the ENTER key.	MOIST. MEASURE CH 1: ▽INPUT NAME NAME LIST CLEAR ALL NAME	"INPUT NAME" will not appear on Level "0".
3) Input the channel number	Move the cursor to the position to enter the channel number and input the desired number. Hit the ENTER key.	INPUT NAME ＣＨ １： CLEAR NAME Ｆ５：→ Ｆ３：CHANGE ＡＢＣＤＥＦＧＨＩＪＫＬＭＮＯ ＰＱＲＳＴＵＶＷＸＹＺ１２３４ ５６７８９０ ＋－＊／＝．（） ！“＃＄％＆‘；？［］｛｝＜＞	
4) Clear the name	Move the bar cursor on CLEAR NAME and hit the ENTER key. (There will be no confirmation Yes/No message appears. Clears at once.)	INPUT NAME ＣＨ １： NAME CLEAR Ｆ５：→ Ｆ３：CHANGE ＡＢＣＤＥＦＧＨＩＪＫＬＭＮＯ ＰＱＲＳＴＵＶＷＸＹＺ１２３４ ５６７８９０ ＋－＊／＝．（） ！“＃＄％＆‘；？［］｛｝＜＞	The channel name will be initialized. **Do not operate if you don't have to rename.**

Procedure	Operation	LCD	Remarks
5) Input the name	▽ Pick up English characters using F3 and F5 to input desired name. Hit the ENTER key every time after selecting a character. The manner of the cursor movement is as follows: Press ▽key once and the cursor moves down for a line. Press F5 key once and the cursor moves to right for a next letter. Press F3 key once and the language will change. (Alphabetical and Japanese.) For correction, move the cursor over the channel number and press F5 key, the flashing position in the channel name moves to the next right.	INPUT NAME ＣＨ　１： CLEAR NAME Ｆ５：→　Ｆ３：CAHNGE ＡＢＣＤＥＦＧＨＩＪＫＬＭＮＯ ＰＱＲＳＴＵＶＷＸＹＺ１２３４ ５６７８９０　＋－＊／＝．（） ！“＃＄％＆‘；？［］｛｝＜＞ メイショウ　トウロク ＣＨ　１：　コムギコ メイショウ　クリア Ｆ５：→　Ｆ３：キリカエ アイウエオカキクケコサシスセソ タチツテトナニヌネノハヒフヘホ マミムメモヤユヨラリルレロワヲ ンﾞﾟ Caution: Hitting the Enter key or the Clear key with the cursor on the channel number position while you input the name will delete the line. However, when reading the name once set won't delete it by the same operation.	8 characters at maximum.
6) Return to Component Measurement	Press the QUIT key twice.	Returns to COMPO. MEASURE screen.	

Note: On "Input Name", you can't preset frequently used channels to F1~F5 keys.

7.4.2 Displaying the List of Channel Names (Operations on Level "1")

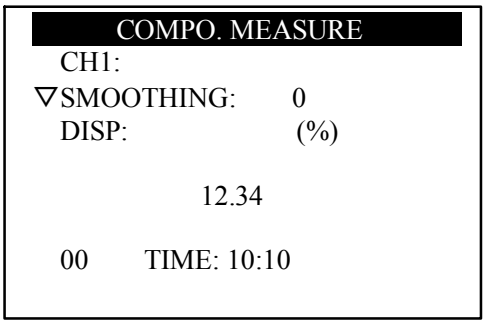
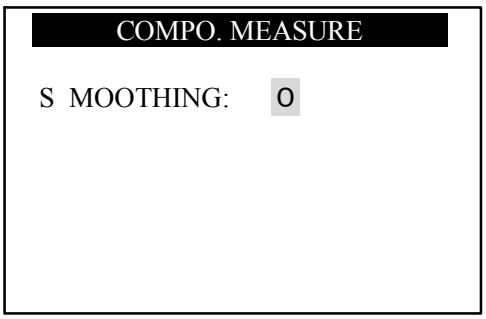
Procedure	Operation	LCD	Remarks
1) Select NAME LIST	Move the cursor over NAME LIST and hit the ENTER key.	COMPO. MEASURE CH 1: INPUT NAME ▽NAME LIST CLEAR ALL NAME	
2) Display NAME LIST	Press the cursor key and the screen will scroll.	NAME LIST CH: NAME 1: FLOUR 2: TOBACCO 3: METAL 4: MILD 7 5: WEST-1 6: ALUMINA	
3) Return to Component Measurement	Press the QUIT key twice.	Returns to COMPO. MEASURE screen.	

7.4.3 Clearing All the Stored Channel Names (on Level "1")

Procedure	Operation	LCD	Remarks
1) Select CLEARALL NAME	Move the cursor over CLEAR ALL NAME and hit the ENTER key.	COMPO. MEASURE CH 1: INPUT NAME NAME LIST ▽CLEAR ALL NAME	
2) Clear all the names	Move the cursor over YES or NO and hit the ENTER key. YES to clear, NO to cancel.	COMPO. MEASURE CALEAR ALL NAME ARE YOU SURE? ▽YES NO	
3) Return to Component Measurement	Press the QUIT key twice.	Returns to COMPO. MEASURE screen.	

7.5 Setting Parameters

7.5.1 Changing the Smoothing Constant (Operations on Level "0")

Procedure	Operation	LCD	Remarks
1)Select SMOOTHING mode	Move the cursor over SMOOTHING and hit the Enter key.		
2)Set the smoothing value	Input the smoothing value in the flashing position and hit the Enter key.		The smoothing values are graded in 6 steps, 0~5.
3) Return to Component Measurement	Press the QUIT key.	Returns to COMPO. MEASURE screen.	

Note:

Smoothing values have 6 grades, 0~5.

Response speed slows down as the smoothing value increase.

Set the smallest value as possible to read the display. O or 1 recommended.

Display % wavers a little → Smoothing value toward 0

Display % wavers much → Smoothing value toward 5

Smoothing value	0	1	2	3	4	5
Time Constant (sec)	0	1	2	4	8	16

7.5.2 Changing the Display (Operations on Level "0")

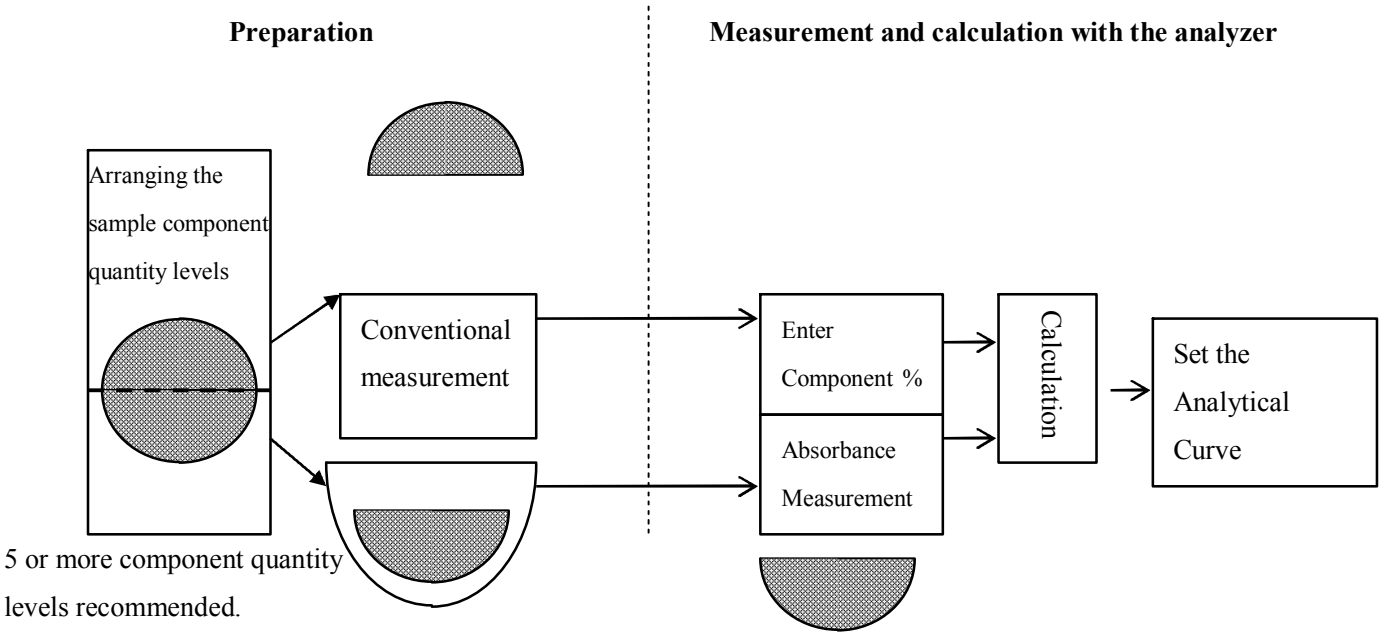
Procedure	Operation	LCD	Remarks
1) Select Display (%)	Move the cursor over DISP and hit the ENTER key.	COMPO. MEASURE CH 1: SMOOTHING: 0 ▽DISP: (%) 12.34 00 TIME: 10:10	
2) Select from COMPO% and Absorbance X	Select DISP with the cursor. Hitting the ENTER key every time changes the display as below: % → X 1 X 3 ← X 2 ←	COMPO. MEASURE ▽DISP: (%) DIGIT: 2	X3 will not appear on JE-30.
3) Set the digits under the decimal point	Select DIGIT with the cursor. Hitting the ENTER key every time changes the digits as below: 0 → 1 2 ←	COMPO. MEASURE DISP: (%) ▽DIGIT:2	
4) Return to Component Measurement	Press the QUIT key.	Returns to COMPO. MEASURE screen.	

7.6 Programming Analytical Curve (Calibration)

There are following three cases in programming the Analytical Curve for the analyzer:

1) Entering the absorbance and the associated Component value (%) data at the same time after having the sample component values conventionally measured.
2) Measuring the absorbance first and having the sample conventionally tested to enter the associated component value afterward.
3) Entering the Analytical Curve coefficients only.

Flowchart of Making Analytical Programming



5 or more component quantity levels recommended.

Preparation

Prepare samples containing different amount of component to be measured. Samples containing 5 or more component quality levels are recommended. Arrange the sample component quality levels 10~20% wider than usually measured. Measure the half of each sample by a conventional way at laboratory, (i.e. the drying method for moisture measurement) and note the data to input in the analyzer. This data is a basic criterion for the analyzer to associate them with the NIR absorbance of the rest half of the same samples.

The following table is an example of sample's moisture content to instruct the procedure for programming the Analytical Curve. The number of measurement by the analyzer is small here, but for the accuracy of the measurement, we recommend to collect 30 sampling data.

Sample	A	B	C	D
Moisture	10.8%	15.4%	9.5%	13.5%

7.6.1 Case 1: You Already Have Actual Component Value Data. (Operations on Level 1)

Warm up the analyzer well before operation.

Procedure	Operation	LCD	Remarks
1) Display Main Menu	Press the QUIT key.	COMPO. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select Calibration Mode	Move the cursor over PROG A. CURVE and hit the ENTER key.	MAIN MENU COMPO. MEASURE ▽PROG. A. CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 1	
3) Select Channel	Move the cursor over CH and hit the ENTER key.	PROG. A. CURVE ▽CH: 1 INPUT A.CURVE CALC. A. CURVE COEFF INPUT CLEAR ALL DATA	
4) Select CH number	Enter the desired channel number in the flashing cursor and hit the ENTER key. i.g. Channel 10 Press the QUIT key to return to PROG. A. CURVE screen.	PROG. A. CURVE ▽CH: 10	

Procedure	Operation	LCD	Remarks
5)Initialize the A.Curve Calculation data	Move the cursor over the CLEAR ALL DATA and hit the ENTER key.	PROG. A. CURVE CH: 10 INPUT A. CURVE CALC. A.CURVE COEFF INPUT ▽CLEAR ALL DATA	
	Select YES to clear the old data, or NO to cancel and hit the ENTER key. The screen will return to PROG. A.CURVE.	PROG. A. CURVE CLEAR ALL DATA ▽YES NO	
6) Select INPUT A.CURVE	Move the cursor over INPUT A. CURVE and hit the ENTER key.	PROG. A. CURVE CH10: ▽INPUT A. CURVE CALC. A. CURVE COEFF. INPUT CLEAR ALL DATA	
	INPUT A. CURVE screen will appear.	INPUT A. CURVE CH10: NO. : 0/0 X1: X2: X3: %:	The number of all the data will be displayed in "NO.: 0/0". Note: X3 will not appear in JE-130.
7) Measure the absorbance of sample A	Set the sample A for measurement and press the SAMPLE key. Absorbance data will be sampled in a few seconds. Hit the ENTER key after the absorbance has been displayed.	INPUT A.CURVE CH10: NO.: 0/0 X1: 0. 5016 X2: 0. 0143 X3: 0. 0029 %:	

Procedure	Operation	LCD	Remarks
8) Input the moisture content of the sample A.	Input the moisture value of the sample A and hit the ENTER key.	INPUT A.CURVE CH10: NO.: 1/1 X1: 0. 5016 X2: 0. 0143 X3: 0. 0029 %: 10.8	Enter 0 if you are entering the actual moisture value afterward.
9)Measure the absorbance of sample B	Set the sample B for measurement and press the SAMPLE key. Absorbance data will be sampled in a few seconds. Hit the ENTER key after the absorbance has been displayed.	INPUT A. CURVE CH10: NO.: 1/1 X1: 0. 9704 X2: 0. 0115 X3: 0. 0031 %:	
10) Input the moisture content of the sample B	Input the moisture value of the sample B and hit the ENTER key.	INPUT A. CURVE CH10: NO.: 1/1 X1: 0. 9704 X2: 0. 0115 X3: 0. 0031 %: 15.4	Enter 0 if you are entering the actual moisture value afterward.
11) Measure the absorbance of sample C	Set the sample C for measurement and press the SAMPLE key. Absorbance data will be sampled in a few seconds. Hit the ENTER key after the absorbance has been displayed.	INPUT A. CURVE CH10: NO.: 2/2 X1: 0. 3344 X2: 0. 0129 X3: 0. 0018 %:	
12) Input the moisture content of the sample C	Input the moisture value of the sample C and hit the ENTER key.	INPUT A. CURVE CH10: NO.: 2/2 X1: 0. 3344 X2: 0. 0129 X3: 0. 0018 %: 9.5	Enter 0 if you are entering the actual moisture value afterward.

Procedure	Operation	LCD	Remarks
13) Measure the absorbance of sample D	Set the sample D for measurement and press the SAMPLE key. Absorbance data will be sampled in a few seconds. Hit the ENTER key after the absorbance has been displayed.	INPUT A. CURVE CH10: NO.; 3/3 X1: 0. 7151 X2: 0. 0187 X3: 0. 0030 %:	
14) Input the moisture content of the sample D	Input the moisture value of the sample D and hit the ENTER key.	INPUT A. CURVE CH10: NO.; 3/3 X1: 0. 7151 X2: 0. 0187 X3: 0. 0030 %: 13.5	Enter 0 if you are entering the actual moisture value afterward.
	Press the QUIT key to return to PROG.A. CURVE menu screen.	INPUT A. CURVE CH10: NO.: 4/4 X1: X2: X3: %:	
15) Select Calc. A. CURVE Mode	Move the cursor over CALC. A.CURVE and hit the ENTER key.	PROG. A. CURVE CH10: INPUT A. CURVE ▽CALC. A. CURVE COEFF. INPUT CLEAR ALL DATA	
16) Select the absorbance to use for the calculation	Select the absorbance with the cursor key and press+/-key to set to use and hit the ENTER key. Pressing +/- key changes from/to ○(Use) and x(Not Use). o to use the absorbance x not to use.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Note: X3 will not appear n JE-130.

Procedure	Operation	LCD	Remarks
17)Calculation of A. Curve	After selecting the absorbance to use for the calculation, select YES or NO with the cursor and hit the ENTER key.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Example on the left shows Absorance 1 and 2 is selected to use while 3 not to use.
18)Display the calculation result	The calculation result will be displayed. Select YES to save the coefficients or NO for re-calculation and hit the ENTER key.	CALC. RESULTS a0: 5.17988 a1: 9.64661 a2: 72.4140 a3: 0 SE: 0.309 R: 0.998 YES NO	Note: a3 will not appear in JE-130. A0~3 shows the A. Curve coefficients. SE stands for Standard Deviation of the Analytical Curve. R stands for Correlation Coefficient.
	Selecting NO at above returns to the X SELECT screen. Select the absorbance or NO to exit.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Note: a3 will not appear in JE-130.
	Selecting YES saves the coefficients and returns the LCD to the PRG. A. CURVE screen. Press the QUIT key to return to MAIN MENU.	PROG. A. CURVE CH10: INPUT A. CURVE ▽CALC. A. CURVE COEFF. INPUT CLEAR ALL DATA	The coefficients are saved in the channel 10 in the left example.

Procedure	Operation	LCD	Remarks
19) Display MOIST. MEASURE	Move the cursor over MOIST. MEASURE and hit the ENTER key.	MAIN MENU ▽ MOIST. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 1	
	Return to MOSIT. MEASURE screen	MOIST. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	

Note:

1) How to select wavelengths (absorbance) to use:

Recommended good data is that covers component % range widely and the number of the data exceeds 10 x each wavelength.

First calculate with all the wavelengths and note the SE and R of the result. Next, check the following points and select the wavelengths to use for the calculation. (For moisture measurement, always include X1 with other wavelengths.

i. In moisture measurement, select combinations that make the coefficient "a1" + in the result.

ii. Select combinations that make the correlation coefficient (R) + in the result.

iii. Select combinations that make SE appear smaller in the result.

iv. Select combinations that make the coefficients appear smaller as possible, 100 or under in moisture measurement.

v. When analyzing with the combination of the wavelength, the T value of the each coefficient is 2 or larger. This can only be applied when analyzing with Excel software and the T value can be obtained.

2) If you are measuring the absorbance of the sample first and entering the actual component % afterward, input 0 to proceed. Read 7.6.2 to learn how to enter

Read 7.6.2 for learning how to enter the actual component value afterward.

7.6.2 Case 2: You Input Actual Component Data Afterward (Operations on Level 1)

Input the measured absorbance value in advance as on 7.6.1, but input 0 for the actual component value instead until you have the actual component value of the same sample.

Procedure	Operation	LCD	Remarks
1) Display MAIN MENU	Press the QUIT key.	MOIST. MEASURE ▽CH1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select PROG. A. CURVE	Move the cursor over PROG. A. CURVE and hit the ENTER key.	MAIN MENU MOIST. MEASURE ▽PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	
3) Select Channel	Move the cursor over CH and hit the ENTER key.	PROG. A. CURVE ▽CH: 1 INPUT A.CURVE CALC. A. CURVE COEFF INPUT CLEAR ALL DATA	
4) Select CH number	Enter the desired channel number in the flashing cursor and hit the ENTER key. i.g. Channel 10 Press the QUIT key to return to PROG. A. CURVE screen.	PROG. A. CURVE ▽CH: 10	Select the channel you have entered the associated absorbance to pair with the actual component value.

Procedure	Operation	LCD	Remarks
5) Select INPUT A.CURVE	Move the cursor over INPUT A. CURVE and hit the ENTER key.	PROG. A. CURVE CH10: ▽INPUT A. CURVE CALC. A. CURVE COEFF. INPUT CLEAR ALL DATA	
6) Input the actual moisture value of the sample A.	Input the actual moisture value of the sample A and hit the ENTER key.	INPUT A. CURVE CH10: NO. : 1／4 X1: 0.5016 X2: 0.0143 X3: 0.0029 %: 10.8	Data No. displays the number of the data. Hit the ENTER key to change the number of the data. Note: X3 will not appear in JE-130.
7) Input the actual moisture value of the sample B.	Move the cursor over the "%" by hitting the ENTER key a few times. Input the actual moisture value of the sample B and hit the ENTER key.	INPUT A. CURVE CH10: NO. : 2／4 X1: 0.9704 X2: 0.0115 X3: 0.0031 %: 15.4	Hit the ENTER key to change the number of the data.
8) Input the actual moisture value of the sample C.	Move the cursor over the "%" by hitting the ENTER key a few times. Input the actual moisture value of he sample C and hit the ENTER key.	INPUT A. CURVE CH10: NO. : 3／4 X1: 0.3344 X2: 0.0129 X3: 0.0018 %: 9.5	Hit the ENTER key to change the number of the data.

Procedure	Operation	LCD	Remarks
9) Input the actual moisture value of the sample D.	Move the cursor over the "%" by hitting the ENTER key a few times. Input the actual moisture value of he sample D and hit the ENTER key.	INPUT A. CURVE CH10 : NO. : 4／4 X1 : 0. 7151 X2 : 0. 0187 X3 : 0. 0030 % : 13. 5	Hit the ENTER key to change the number of the data.
	Press the QUIT key to return to PROG. A. CURVE screen	INPUT A. CURVE CH10 : NO. : 4／4 X1 : X2 : X3 : % :	
10) Select Prog. A. Curve mode	Move the cursor over PROG. A. CURVE and hit the ENTER key.	PROG. A. CURVE CH 10: INPUT A. CURVE ▽CALC. A.CURVE COEFF INPUT CLEAR ALL DATA	
16) Select the absorbance to use for the calculation	Select the absorbance with the cursor key and press+/-key to set to use and hit the ENTER key. Pressing +/- key changes from/to ○(Use) and x(Not Use). o to use the absorbance x not to use.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Note: X3 will not appear n JE-130. See what to select at the end of this column.

Procedure	Operation	LCD	Remarks
12)Calculation of A. Curve	After selecting the absorbance to use for the calculation, select YES or NO with the cursor and hit the ENTER key.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Example on the left shows Absorance 1 and 2 are selected to use while 3 is not to use.
13)Display the calculation result	The calculation result will be displayed. Select YES to save the coefficients or NO for re-calculation and hit the ENTER key.	CALC. RESULTS a0: 5.17988 a1: 9.64661 a2: 72.4140 a3: 0 SE: 0.309 R: 0.998 YES NO	Note: a3 will not appear in JE-130. A0~3 shows the A. Curve coefficients. SE stands for Standard Deviation of the Analytical Curve. R stands for Correlation Coefficient.
	Selecting NO on above returns to the X SELECT screen. Select the absorbance or NO to exit.	CALC. A. CURVE "X" SELECT X 1 o X 2 o X 3 x ARE YOU SURE? YES NO	Note: a3 will not appear in JE-130.
	Selecting YES saves the coefficients and returns the LCD to the PRG. A. CURVE screen. Press the QUIT key to return to MAIN MENU.	PROG. A. CURVE CH10: INPUT A. CURVE ▽CALC. A. CURVE COEFF. INPUT CLEAR ALL DATA	The coefficients are saved in the channel 10 in the left example.

Procedure	Operation	LCD	Remarks
14) Display MOIST. MEASURE	Move the cursor over MOIST. MEASURE and hit the ENTER key.	MAIN MENU ▽ MOIST. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL: 1	
	Return to MOSIT. MEASURE screen	MOIST. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	

Note:

1) How to select wavelengths (absorbance) to use:

Recommended good data is that covers component % range widely and the number of the data exceeds 10 x each wavelength.

First calculate with all the wavelengths and note the SE and R of the result. Next check the following points and select the wavelengths to use for the calculation. (For moisture measurement, always include X1 with other wavelengths.

i. In moisture measurement, select combinations that make the coefficient "a1" + in the result.

ii. Select combinations that make the correlation coefficient (R) + in the result.

iii. Select combinations that make SE appear smaller in the result.

iv. Select combinations that make the coefficients appear smaller as possible. 100 or under in moisture measurement.

v. When analyzing with the combination of the wavelengths, the T value of the each coefficient is 2 or larger. This can only be applied when analyzing with Excel software and the T value can be obtained.

7.6.3 Case 3: You Input Analytical Curve Coefficient Alone (Operations on Level 1)

This is the case you enter only the Analytical coefficient that was calculated by the PC software .

Procedure	Operation	LCD	Remarks
1) Display the Main Menu	Press the QUIT key.	MOIST. MEASURE ▽CH1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select PROG. A. CURVE	Move the cursor over PROG. A. CURVE and hit the ENTER key.	MAIN MENU MOIST. MEASURE ▽PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	
4) Select CH number	Enter the desired channel number in the flashing cursor and hit the ENTER key. i.g. Channel 10 Press the QUIT key to return to PROG. A. CURVE screen.	PROG. A. CURVE ▽CH: 10	.
3) Select Coefficient Input	Move the cursor over COEFF INPUT and hit the ENTER key.	PROG. A. CURVE CH: 1 INPUT A.CURVE CALC. A. CURVE ▽COEFF INPUT CLEAR ALL DATA	

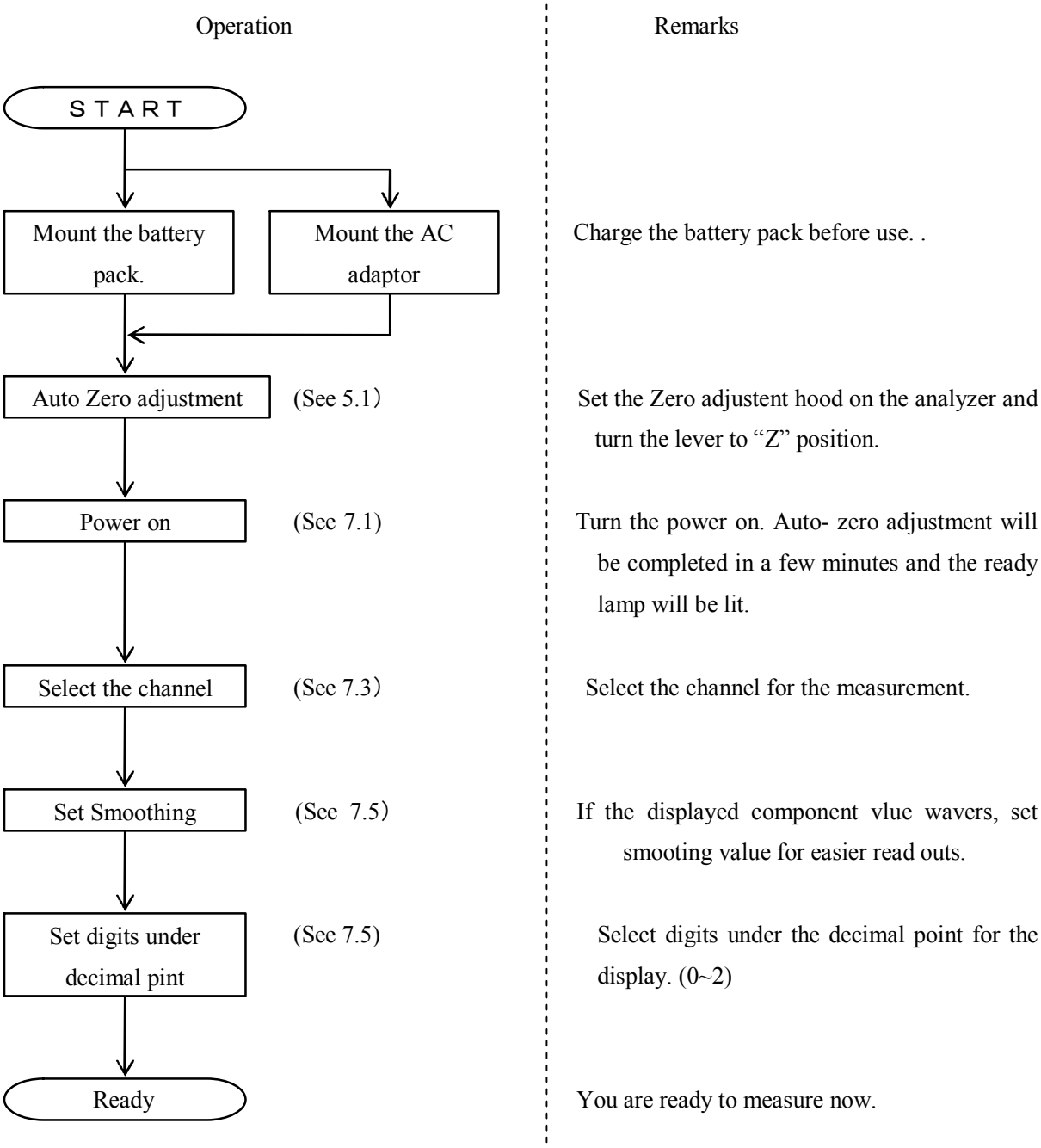
Procedure	Operation	LCD	Remarks
6) Input the A. Curve coefficients	Input the coefficient on a0~a3 and hit the ENTER key. If you don't input just hit the ENTER key. After you have input all the coefficients, the ENTER key saves them and returns the screen to PROG. A. CURVE	COEFF INPUT a0: 5.17988 a1: 9.64661 a2: 72.4140 a3: 0 A : 0 B : 1	Note: a3 will not appear in JE-130. A: Correction coefficient (Intercept) B: Correction coefficient. (Inclination)
	Press the QUIT key to return to MAIN MENU.	**PROG. A. CURVE** CH: 1 INPUT A.CURVE CALC. A. CURVE ▽COEFF INPUT CLEAR ALL DATA	
7) Display MOIST. MEASURE	Move the cursor over MOIST. MEASUREMENT and hit the ENTER key.	MAIN MENU MOIST. MEASURE ▽PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	
	Returns to MOIST. MEASURE screen.	MOIST. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	

8. Daily Operation

Once you have programmed the analytical curve for the sample, you can start for the measurement. Before starting the measurement, complete the initial setting on the analyzer.

8.1 Flowchart of the Initial Setting

Flow the procedure to complete the initial setting before the measurement.


Operation
Remarks
START
Mount the battery pack.
Mount the AC adaptor
Charge the battery pack before use. .
Auto Zero adjustment
(See 5.1）
Set the Zero adjustent hood on the analyzer and turn the lever to “Z” position.
Power on
(See 7.1)
Turn the power on. Auto- zero adjustment will be completed in a few minutes and the ready lamp will be lit.
Select the channel
(See 7.3）
Select the channel for the measurement.
Set Smoothing
(See 7.5）
If the displayed component vlue wavers, set smooting value for easier read outs.
Set digits under decimal pint
(See 7.5)
Select digits under the decimal point for the display. (0~2)
Ready
You are ready to measure now.

8.2 How to Measure

There are three measurement modes; Sample, Monitor (Continuous) and Average. Select one on the System Setting regardless of the menu level.

1) Sample Measurement

Sample measurement is a mode to measure the sample by the batch or uneven cycles.

Read out the displayed value while you manually press the SAMPLE key. The displayed value will be held and saved in the analyzer when you release the key. This way you can save 99 data at maximum.

The number of the saved data will be displayed in the lower part of the LCD, left to the time display.

To clear or display the data in the memory, see 8.3.1 "Displaying and Deletion of the Saved data". To output the data to a PC or a printer, see 8.4.2 "Sending Out the Saved Data".

2) Monitor Measurement

Monitor measurement is a real time and continuous measurement mode.

You can save the data any moment by pressing the SAVE key (without pressing the SAMP key).

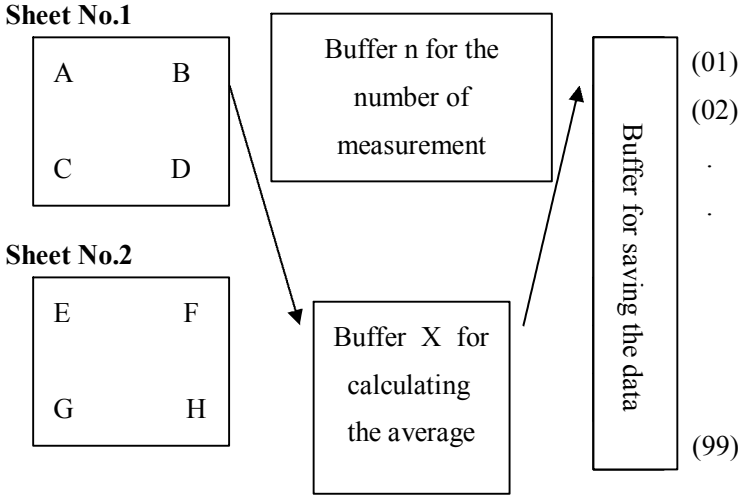
The saved data can be treated in the same way as the Sample Measurement mode.

You can print out the data at a desired periodical cycle.

3) Average Measurement

In this mode you can measure up to 99 different locations of a sample to calculate the average of these measured data.

Suppose you measure each four corners (A~D and E~H) of two sheet papers as in the example below:



Measured moisture data

Spot	Moist.	n	X
A	5.0%	1	5.0
B	6.0%	2	5.5
C	5.2%	3	5.4
D	5.0%	4	**5.3**
E	6.0%	1	6.0
F	7.0%	2	6.5
G	6.2%	3	6.4
H	6.0%	4	**6.3**

When you press the SAMPLE key at position "A", moisture value is displayed. The analyzer holds the data as you release the key. By pressing the SVE key, the data of the position "A", 5.0% will be saved in the buffer for calculating the average and the number of measurement will be 1. This number will be displayed on the right of the measurement value (%).

Again, when you press the SAMPLE key on the position “B” of the sheet paper No.1 the measurement value is displayed. The analyzer holds the value as you release the key. By pressing the SAVE key, the data of the position A + B /2, 5.5 % will be saved and the number of measurement will be 2.

In the same manner, when you press the SAVE key after measuring the position “C”, the data of the position A+B+C/3, 5.4% will be saved. After measuring D, the data of the position A+B+C+D/4, 5.3% will be saved and the number of the measurement will advance accordingly.

After having measured the four positions, press the SAVE key again to save the last averaged data 5.3 % in the buffer for saving the data as 01. The number of the saved data will be displayed on the left of the time display of LCD.

At this moment, the number of the saved data is “01” but the number for calculating average will not be cleared to 0. To clear it, press the CLEAR key. The number for calculating average will be 0 and the display will return to 0 as well.

Measure the position E~G of the sheet paper No.2 in the same manner and press the SAVE key. The averaged measurement value (%) will be saved in the buffer for saving the data as 02.

After you have closed the average measurement mode, the display for the number of the saved data remains as “02” and the averaged measured value of the sheet paper No. 2 remains on the LCD

On Average Measurement mode, pressing the SAVE key twice by mistake will transfer the data from the “Buffer for calculating the average” to the “Buffer for saving the data”.

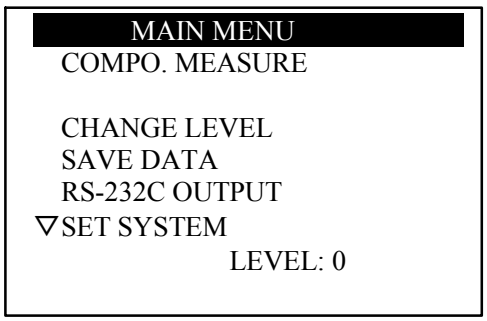
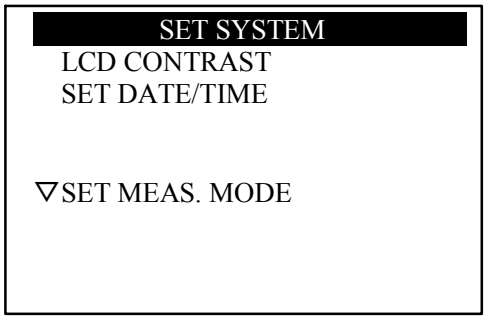
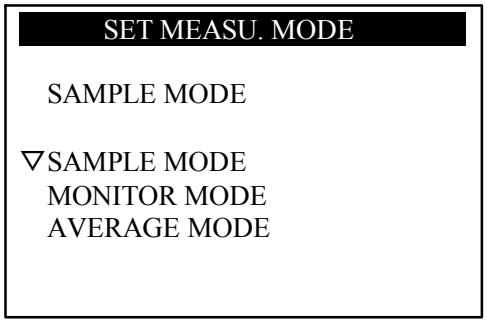
Note:

Calculating average will be continued unless you press the CLEAR key.

8.2.1 Setting the Measurement Mode (Operations on Level 0)

Select and set the measurement mode from Sample, Monitor and Average.

Procedure	Operation	LCD	Remarks
1) Display Main Menu	Press the QUIT key.	MAIN MENU ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	

Procedure	Operation	LCD	Remarks
2) Select SET SYSTEM Mode.	Move the cursor overset SYSTEM and hit the ENTER key.		
3) Select the measurement mode.	Move the cursor over the SET MEAS. MODE and hit the ENTER key.		
4) Set the measurement mode	Move the cursor over SAMPLE MODE, MONITOR MODE or AVERAGE MODE and hit the ENTER key. i.g. SAMPLE MODE		
5) Return to Measurement screen	Press the QUIT key twice. Move the cursor over the COMPO. MEASURE and hit the ENTER key.	Return to the SET SYSTEM screen. Return to MAIN MENU. Return to COMPO. MEASURE.	

Note:

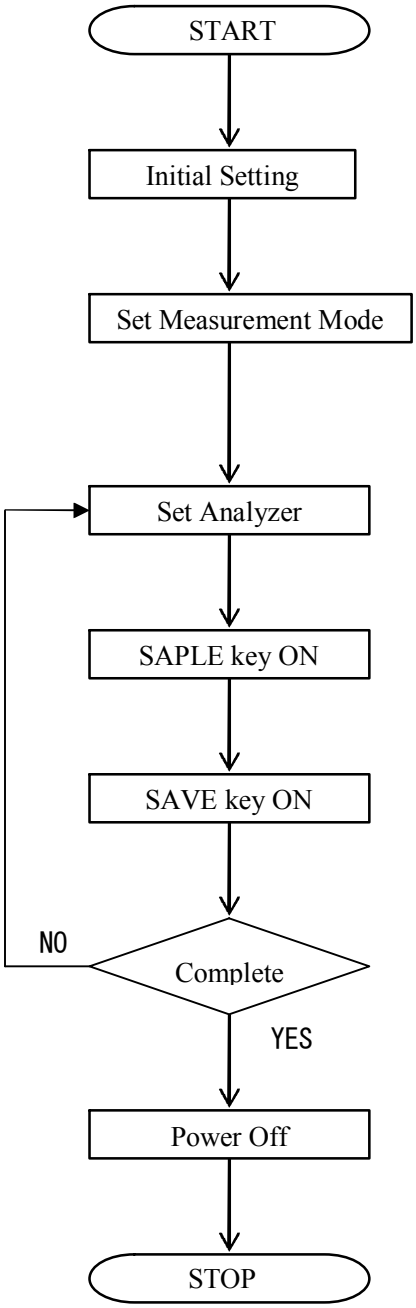
Sample mode measures the sample while you press the SAMPLE key and holds the displayed value when you release the key.

Monitor mode displays the component value real time (continuously).

Average mode measures the component value at multiple positions and displays its calculated average.

8.2.2 Measuring by Sample Mode

Operation



Remarks

See the flowchart of Initial Setting (Page 8-1.)

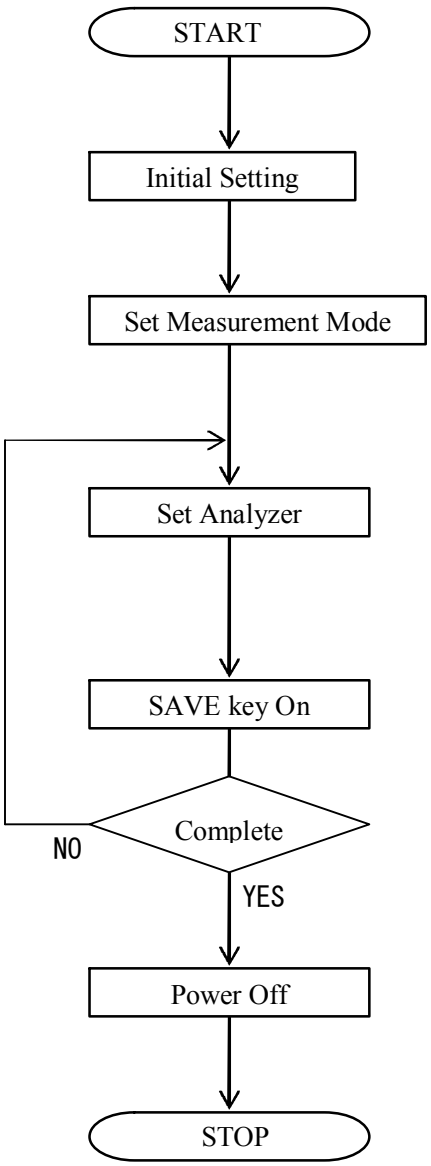
Set for Sample Mode.
When you save the data, clear the old data.

Bring the analyzer over the sample and adjust the distance with the light beam indicator.
Press the SAMPLE key, release the key when the display value starts to stay steady. The displayed value will be held.
Press the SAVE key to save the data in the analyzer.

To display the saved data, see page 8.3.

Turn the power off after use.

8.2.3 Measuring by Monitor Mode



Remarks

See the flowchart of Initial Setting (Page 8-1).

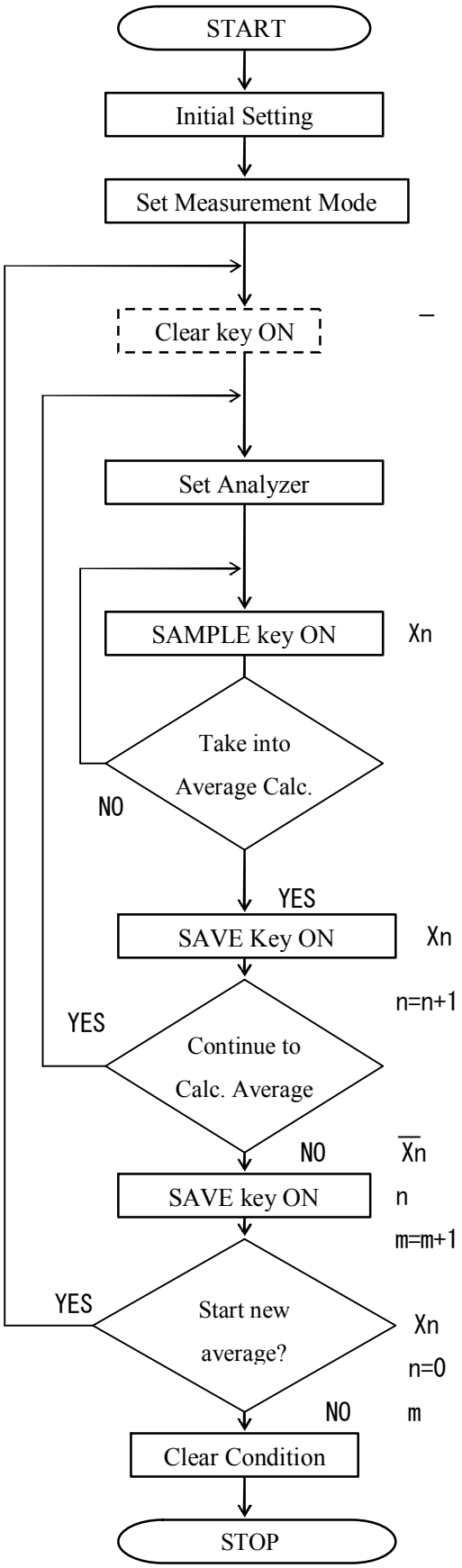
Set for Monitor Mode.
When you save the data, Clear the old data.

Bring the analyzer over the sample and adjust the distance with the light beam inidicator. The componet value will be displayed continuously.

Press the SAVE key if you want to save the data in the analyzer.
To display the saved data, see 8.3.

Turn the power off after use.

8.2.4 Measuring by Average Mode



Operation

Remarks

See the flow chart of Initial Setting. (Page 8-1)

Set for Monitor Mode. When you save the data, clear the old data.

Press the CLEAR key. The avarage display($\overline{Xn}$) of the component value will be 0. Measurement number (n) will be also initialized as 0.

Bring the analyzer over the sample and adjustthe distance with the light beam inidicator.

The analyzer continues maesurement during the SAMPLE key is pressed and holds the value when the key is released.

Check the display value is normal.

Takes the displayed value into avarage calaculation.
LCD will show the number of measurement to calculate the avaerage. (99 at maximum.)
The displayed component value now is the avaraged value.

Check the display and decide if you measure another spot of the sample.

The analyzer stops calculating the average and saves the averaged data.
The number of the saved data (m) will advance.

Select other measurement modes leaving the Average mode at the Set System menu. When you select Sample Mode, it appears like the left but “m” won’t be 0 . To reset as “m=0”, clear at “Clear All Data” in the Save Data menu.

8.3 Operations on Saved Data

8.3.1 Display and Deletion of the Saved Data (Operations on Level 0)

How to display and delete the saved data:

See “8.4” for RS232-C output.

Procedure	Operation	LCD	Remarks
1) Display MAIN MENU	Press the QUIT key to display MAIN MENU.	COMPO. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select SAVE DATA	Press the QUIT key and move the cursor over SAVE DTA and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL ▽SAVE DATA RS-232C OUTPUT SET SYSTEM LEVEL: 0	
3) Select DATA DISPLAY	Move the cursor over the DATA DISPLAY and hit the ENTER key.	SAVE DATA ▽DATA DISPLAY CLEAR ALL DATA	
	To display next data, move the cursor over NEXT and hit the ENTER key.	DATA DISPLAY CH:1 05/01/23 #: 1 10:20:30 DATA: 0.1234 0.5678 0.6789 2.34 ▽NEXT DELETE	Cannel No. Date Data No. Time Abs. 1~3 Displayed Value (%) Note: Abs.3 will not appear in JE-130.

Procedure	Operation	LCD	Remarks
4) Deletion of the saved data	To delete the data on the LCD, move the cursor over DELETE and hit the ENTER key.	DATA DISPLAY CH:1 05/01/23 #: 1 10:20:30 DATA: 0.1234 0.5678 0.6789 2.34 NEXT ▽DELETE	The data displayed within the screen will be deleted and next data will appear if any.
5) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SAVE DATA screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

8.3.2 Initializing the Saved Data (Operations on Level 0)

If there are data saved by pressing the SAVE key, you can clear all the data at once.

See “8.4” for RS-232C Output.

Procedure	Operation	LCD	Remarks
1) Display MAIN MENU	Press the QUIT key to display MAIN MENU.	COMPO. MEASURE ▽CH 1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select SAVE DATA	Press the QUIT key and move the cursor over SAVE DTA and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL ▽SAVE DATA RS-232C OUTPUT SET SYSTEM LEVEL: 0	

Procedure	Operation	LCD	Remarks
3) Deletion of the saved data	Move the cursor over CLEAR ALL DATA and hit the ENTER key. Move the cursor over YES to delete or NO to cancel and hit the ENTER key.	SAVE DATA DATA DISPLAY ▽CLEAR ALL DATA SAVE DATA CALEAR ALL DATA ARE YOU SURE? ▽YES NO	
4) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SAVE DATA screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

8.4 Data Output to Printer or PC

1) Analyzer and Printer

There are following four items to output to the printer from the analyzer. For all of these communications the RS-232C transmission format should be completed at SET SYSTEM menu.

1. Saved data

   Prints out the data #, channel #, date, time absorbance, and the displayed value.

2. Channel parameter

   Prints out the channel #, channel name, smoothing value and the Analytical Curve coefficients saved in the analyzer.

3. Measurement data

   Prints out the displayed data at set intervals.

4. Channel name

   Prints out all the channel names saved in the analyzer.

2) Analyzer and PC

You can send and receive filed data between the analyzer and the PC. Refer to “11” for PC software overview. For details, read the user’s manual of the optional JE-140 PC software.

8.4.1 Setting of RS-232C Transmission Specification (Operations on Level 1)

This operation is needed for setting the transmission format when you send data to a printer or a PC.

Procedure	Operation	LCD	Remarks
1) Display SET SYSTEM menu	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT ▽SET SYSTEM LEVEL: 1	
2) Select SET RS-232C	Move the cursor over SET RS-232C and hit the ENTER key.	SET SYSTEM LCD CONTRAST SET DATE / TIME ▽SET RS-232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL	
3) Set BAUD rate	Move the cursor over BAUD. Each time you hit the ENTER key, the baud rate changes in the following order: 9600→1200→2400 →4800→9600	SET RS-232C ▽BAUD: 9600 PARITY: N BIT: 8 STOP: 1	
4) Set the parity	Move the cursor over PARITY. Each time you hit the ENTER key, the value changes in the following order: ┌→N→O →E ┐ └──────┘	SET RS-232C BAUD: 9600 ▽PARITY: N BIT: 8 STOP: 1	

Procedure	Operation	LCD	Remarks
5) Set the bit length	Move the cursor over BIT. Each time you hit the ENTER key, the bit length changes in the following order: →8 →7 ┐ └──────┘	SET RS-232C BAUD: 9600 PARITY: N ▽BIT: 8 STOP: 1	
6)Set the stop bit	Move the cursor over STOP. Each time you hit the ENTER key, the bit length changes in the following order: → 1→2 ┐ └──────┘	SET RS-232C BAUD: 9600 PARITY: N BIT: 8 ▽STOP: 1	
7) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SAVE DATA screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

Recommended PC spec.	
Baud rate	9600
Parity	N
Bit	8
Stop bit	1

Recommended printer spec.	
Baud rate	9600
Parity	N
Bit	8
Stop bit	1

8.4.2 Sending Out the Saved data to PC or Printer (Operations on Level 0)

Here's how to send the saved data to a PC or printer. You have to set the transmission format at SET RS-232C menu beforehand.

Procedure	Operation	LCD	Remarks
1) Select SET RS-232C	Move the cursor over SET RS-232C and hit the ENTER key.	SET SYSTEM LCD CONTRAST SET DATE / TIME ▽SET RS-232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL	
2) Select SAVE DATA mode	Move the cursor over SAVE DATA and hit the ENTER key.	RS-232C OUTPUT ▽SAVE DATA USER PARAMETER MEASURED DATA CH NAME	
3) Select the destination	Move the cursor over either PRINTER or PC and hit the ENTER key. The analyzer starts to output when you hit the ENTER key.	RS-232C OUTPUT SAVE DATA ▽ PRINTER PC	**Set up the printer or PC ready to receive before this operation.**
4) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SAVE DATA screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

If you operate to output without a printer or PC connected to the analyzer, all the keys become inoperative until the output action is over in the analyzer.

8.4.3 Sending Out User Parameter to PC or Printer (Operation on Level 0)

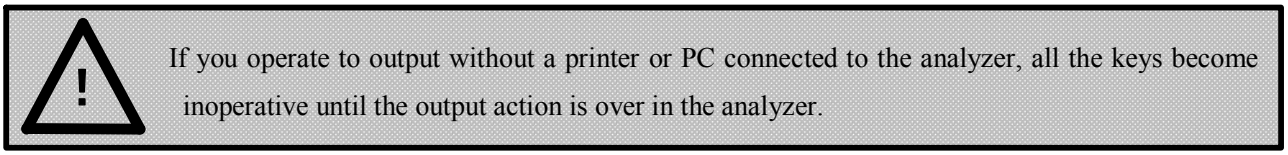
Here's how to send the user parameter to a PC or printer. You have to set the transmission format at SET RS-232C menu beforehand.

Procedure	Operation	LCD	Remarks
1) Select SET RS-232C	Move the cursor over SET RS-232C and hit the ENTER key.	SET SYSTEM LCD CONTRAST SET DATE / TIME ▽SET RS-232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL	
2) Select USER PARAMETER	Move the cursor over USER PARAM. and hit the ENTER key.	RS-232C OUTPUT SAVE DATA ▽USER PARAM. MEASURED DATA CH NAME	
3) Select the channel	Move the cursor over CH and hit the ENTER key.	RS-232C OUTPUT ^ USER PARAM. ▽ CH : 1 PRINTER PC	
4) Input the channel number	Input the channel number you want to output and hit the ENTER key. i.g. Channle 2 Press the QUIT key to return to USER PARAM. screen.	RS-232C OUTPUT USER PARAM. ▽ CH : 2	

Procedure	Opeartion	LCD	Remarks
5) Select the destination	Move the cursor over either of PRINTER or PC and hit the ENTER key. The analyzer starts to output when you hit the ENTER key.	RS-232C OUTPUT SAVE DATA ▽ PRINTER PC	**Set up the printer or PC ready to receive before this operation.** The user parameter has been sent out.
4) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to RS-232C OUTPUT screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

Note:

The data length of both, the acceptor (PC or printer) and the analyzer, should be set at 8 bit.


If you operate to output without a printer or PC connected to the analyzer, all the keys become inoperative until the output action is over in the analyzer.

8.4.4 Sending Out Measurement Data to Printer (Operations on Level 0, effective for printer only)

In the Monitoring mode, you can print out the measurement value at a set interval. When you start the monitor measurement, the analyzer beeps at the interval as sending out the data.

When you use the PC software, the PC controls the time of the interval but the analyzer still beeps.

You have to set the transmission format at SET RS-232C menu beforehand.

Procedure	Operation	LCD	Remarks
1) Select SET RS-232C	Move the cursor over SET RS-232C and hit the ENTER key.	SET SYSTEM LCD CONTRAST SET DATE / TIME ▽SET RS-232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL	
2) Select MEASURED DATA	Move the cursor over MEASURED DATA and hit the ENTER key.	RS-232C OUTPUT SAVE DATA USER PARAMETER ▽MEASURED DATA CH NAME	
3) Set the interval	Move the cursor over INTERVAL and hit the ENTER key.	RS-232C OUTPUT MEASURED DATA ▽ INTERVAL: 5 SEC START STOP	
	Input the interval and hitthe ENTER key. i.g. 10 seconds. Press the QUIT key to return to MEASURED DATA screen.	RS-232C OUTPUT MEASURED DATA INTERVAL : 10 SEC	5~99 seconds available.

Procedure	Operation	LCD	Remarks
4) Start to send out	Move the cursor over START and hit the ENTER key. The analyzer starts to send out the ongoing measurement data.	RS-232C OUTPUT MEASURED DATA INTERVAL : 10 SEC ▽START STOP	**Set up the printer ready to receive before this operation.** The data is sent out each time when the electric beep sounds. If you press the QUIT key to change the screen, the analyzer still keeps sending the data to the printer.
5) Stop the output	Move the cursor over STOP and hit the ENTER key. The analyzer stops the data output.	RS-232C OUTPUT MEASURED DATA INTERVAL : 10 SEC START ▽STOP	
6) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to RS-232C OUTPUT screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

Note:

The data length of both, the acceptor (PC or printer) and the analyzer, should be set at 8 bit.

Once you have started the output you can always return to COMPO. MEASU. screen by pressing the QUIT key but the output is active even after the screen is changed.

To stop the output, operate as descried as above. (Operation 5)

8.4.5 Sending out Channel Names to Printer (Operations on Level 0, effective for printer only)

Here's how to send the channel names to a printer. You have to set the transmission format at SET RS-232C menu beforehand.

Procedure	Operation	LCD	Remarks
1) Display SET SYSTEM menu	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT ▽SET SYSTEM LEVEL: 1	
2) Select Channel Name mode	Move the cursor over CH NAME and hit the ENTER key.	RS-232C OUTPUT SAVE DATA USER PARAMETER MEASURED DATA ▽CH NAME	
4) Start to send	Move the cursor over START and hit the ENTER key. The analyzer starts to send out channel names.	RS-232C OUTPUT CH NAME PRINTER ▽START STOP	**Set up the printer ready to receive before this operation.** All the channel names will be printed out.
5) Return to COMPO. MEASU. screen.	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to RS-232C OUTPUT screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

Note:

The data length of both, the acceptor (PC or printer) and the analyzer, should be set at 8 bit.

If you operate to output without a printer connected to the analyzer, all the keys become inoperative until the output action is over in the analyzer.

8.5 Analytical Curve Correction

8.5.1 Overview of the Correction

The displayed value of the JE-140 may substantially differ from the actual component value at the measurement site. It is therefore necessary to correct the displayed value by specifying an offset value or by a primary correction. When there is an equal gap between the displayed value and the actual component value, the Analytical Curve must be corrected by an offset. Otherwise the Analytical Curve should be corrected by the primary correction.

The construction of the equation for correction is as shown below.

Displayed component value (%) = A + B (Calculated component %)

↓ ↓

Y y

Where A, B are Analytical Curve correction coefficients;

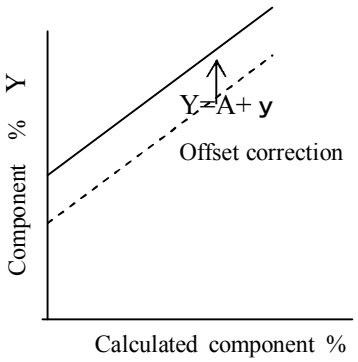
Displayed component value is the % display on the JE-140

Calculated component value is a component value calaculated with absorbance data and analytical coefficients.

8.5.2 Offset Value Correction

Calculate for the Analytical Curve coefficient A.

1) Make a note of the component value displayed on the JE-140.
2) Measure the actual component value of the sample.
3) Derive the value "A" of the Analytical Curve adjustment coefficient by the equotin below, and input it to the JE-140.



The new Analytical Curve Coefficient "A"

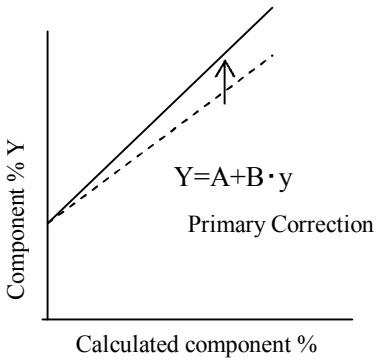
= Average of [(Actual Component Value) – (JE-140 Displayed Value on JE140)] +A'

Where **A'** is the old correction coefficient value saved in the analyzer.

8.5.3 Primary Correction

The Analytical Curve coefficient A and B are derived from the calculated component content and the actual component value data. Use Excel® Regression analysis for this.

Increasing the number of sample observations and a wide range of component contents will proportionately increase the accuracy of the corrected Analytical Curve.



1) Make a note of the component value displayed on the JE-140.
2) Measure the actual component value of the sample.
3) Derive the value **A** and **B** of the Analytical Curve adjustment coefficient by the equotin below, and input them to the JE-140.

Perform regression analysis with the JE-140 displayed value data and the actual component content data.

Regression: Derive the regression coefficients **A''** and **B''** from **A'' + B''** (JE140 displayed value).

Displayed value (%) = A'' + B''[A' +B'(Calculated component value of JE-140)]

= **(A''+A'B'')** + **B''B'** (Calculated component value of JE-140)

The new coefficient A → **The new coefficient B**

Where A' is the old coefficient value saved in the analyzer.

B' is the old coefficient value B saved in the analyzer

Check the multiple correlation coefficients and the standard error of the regression analysis result for credibility before using the regression coefficient for above calculation.

8.5.4 Inputting the Analytical Curve Coefficient (Operations on Level 1)

How to manually input the Analytical Curve correction coefficient derived from the PC software.

Procedure	Operation	LCD	Remarks
1) Display the Main Menu	Press the QUIT key.	COMPO. MEASURE ▽CH1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	
2) Select PROG. A. CURVE	Move the cursor over PROG. A. CURVE and hit the ENTER key.	MAIN MENU COMPO. MEASURE ▽PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	
3) Select PROG. A. CURVE	Move the cursor over PROG. A. CURVE and hit the ENTER key.	MAIN MENU COMPO. MEASURE ▽PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	

Procedure	Operation	LCD	Remarks
4) Select the channel number	Enter the number in the flashing box and hit the ENTER key. i.g. Channel 10 Press the QUIT key to return to the PROG. A. CURVE.	PROG. A. CURVE ▽CH : 10	Select the channel you want to input the coefficients.
5) Select INPUT COEF. mode	Move the cursor over INPUT COEF. and hit the ENTER key.	PROG. A. CURVE CH : 10 INPUT DATA CALC. ▽INPUT COEF. CLEAR ALL DATA	
6) Input the coefficients	Move the cursor over the coef. by the ENTER key. After input all the coefficients, the screen will return to PROG. A. screen.	INPUT DATA a0 : 5. 17988 a1 : 9. 64661 a2 : 72. 4140 a3 : 0 A : 0 B : 1	a3 will not appear in JE-130. A= Coefficient (Intercept) B=Coefficient (Inclination)
	Press the QUIT keyto return to MAIN MENU.	PROG. A. CURVE CH : 10 INPUT DATA CALC. ▽INPUT COEF. CLEAR ALL DATA	

Procedure	Operation	LCD	Remarks
7) Display Component measurement screen.	Move the cursor over COMPO MEASU. and hit the ENTER key.	MAIN MENU ▽COMPO. MEASURE PROG. A.CURVE CHANGE LEVEL SAVE DATA RS232C OUTPUT SET SYSTEM LEVEL:1	
	Returns to COMPO. MEASU. screen.	COMPO. MEASURE ▽CH1: SMOOTH: 0 DISPLAY: (%) 12.34 00 TIME: 10:10	

9. Setting for Other Functions

The other functions are:

1) LCD contrast-----Brightness control

2) Date / Time adjustment----Date /Time on the LCD

Auto-power off ---- Setting the time for auto-power off

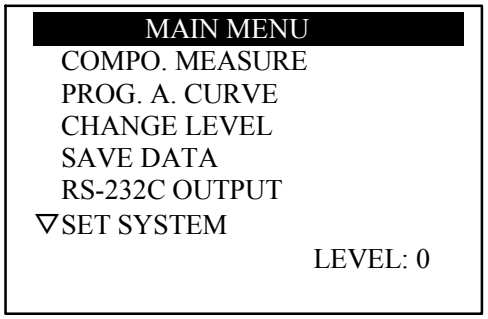
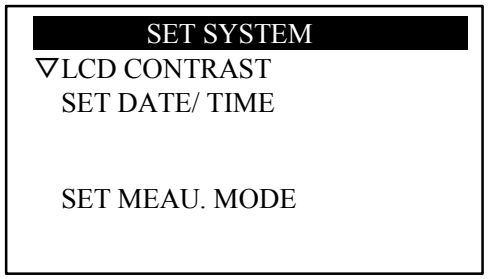
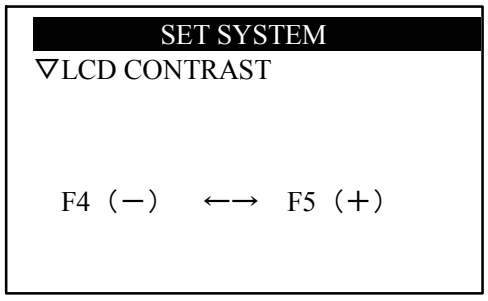
3) Function key----Assigning frequently used channel numbers to the function keys.

4) Remote control----- Setting up for PC, on or off

5) Language selection-----English or Japanese on the LCD

9.1. Setting the LCD Contrast (Operations on Level 0)

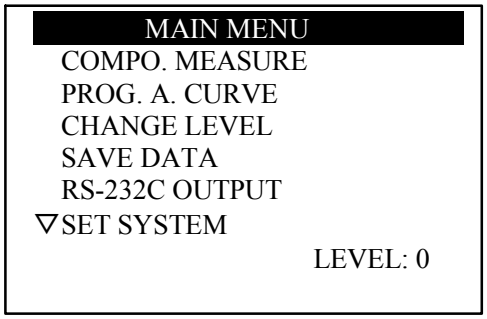
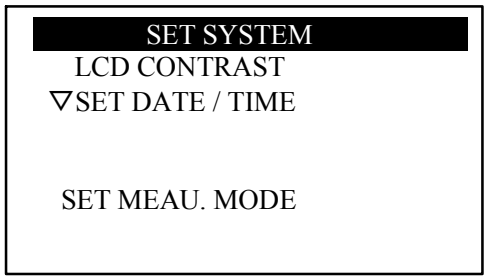
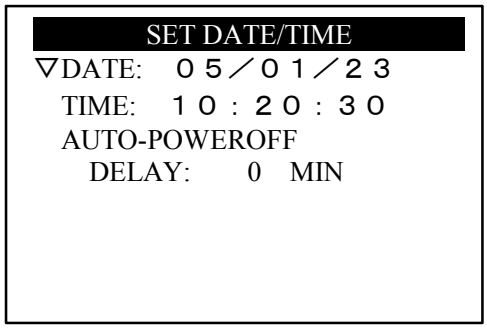
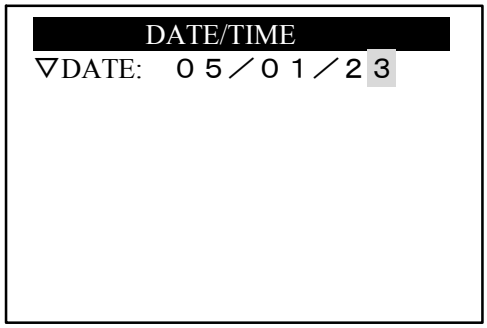
How to adjust the LCD screen brightness:

Procedure	Operation	LCD	Remarks
1) Select SET SYSTEM mode	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.		
2) Select LCD CONTRAST	Move the cursor over LCD CONTRAST and hit the ENTER key.		
3) Adjust the contrast	Press the F4 key for a lighter LCD contrast and F5 key for darker contrast.		
4) Return to COMPO. MEASU. screen	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SET SYSTEM screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

9.2. Setting the Time for Auto-Power Off (Operations on Level 0)

Adjust Date, Time and Set Auto-Power off time

The analyzer automatically turns the power off when no operations are done after the set time.

Procedure	Operation	LCD	Remarks
1) Select SET SYSTEM mode	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.		
2) Select SET DATE/ TIME	Move the cursor over SET DATE/TIME and hit the ENTER key.		
3) Adjust the date	Move the cursor over DATE and hit the ENTER key.		
	Input year, month, date in order and hit the ENTER key. Press the QUITE key to return to SET DATE/TIME screen.		Add “0” for single digit numbers. １→０１

Procedure	Operation	LCD	Remarks
4) Adjust the time	Move the cursor over TIME and hit the ENTER key.	SET DATE/TIME DATE: ０５／０１／２３ ▽TIME: １０：２０：３０ AUTO-POWEROFF DELAY: 0 MIN	
	Input the hour, minute, second in order and hit the ENTER key. Press the QUITE key to return to SET TIME /DATE screen.	DATE/TIME ▽TIME: １０：２０：３０	Add “0” for single digit numbers. １→０１
5) Set time for Auto -Power off	Move the cursor over AUTO-POWER OFF and hit the ENTER key.	SET DATE/TIME DATE: ０５／０１／２３ TIME: １０：２０：３０ ▽AUTO-POWER OFF DELAY: 0 MIN	
	Input the time for Auto-Power off and hit the ENTER key. Press the QUITE key to return to SET TIME /DATE screen.	SET DATE/TIME ▽AUTO POWER OFF DEALAY: ０ min	1~99 min available. Input 0 if unnecessary.
4) Return to COMPO. MEASU. screen	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SET SYSTEM screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

9.3 Setting the Function Keys (Operations on Level 1)

You can assign frequently used channels to the function keys (F1~F5)

Procedure	Operation	LCD	Remarks
1) Select SET SYSTEM mode	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT ▽SET SYSTEM LEVEL: 0	
2) Select SET FUNC. KEY	Move the cursor over the SET FUNC. KEY and hit the ENTER key.	SET SYSTEM LCD CONTRAST DATE / TIME SET RS-232C ▽SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL	
3) Input the channel number	Input the channel number on each function key and hit the ENTER key. The screen returns to SET SYSTEM. You can return to SET SYSTEM screen by the QUITE key even before assigning all the keys.	SET FUNC. KEY F 1 CHANNEL : 1 F 2 CHANNEL : 2 F 3 CHANNEL : 3 F 4 CHANNEL : 4 F 5 CHANNEL : 5	Valid channel number is 1~50
4) Return to COMO. MEASU. screen	Press the QUIT key. Move the cursor over COMPO. MEASU. and hit the ENTER key.	Returns to MAIN MENU. Returns to COMPO. MEASU.	

9.4 Setting the Remote Control (Operations on Level 1)

When the analyzer is externally controlled through the RS-232C communication port, the remote control should be ON. If you are using the optional software with a PC, it should always be ON.

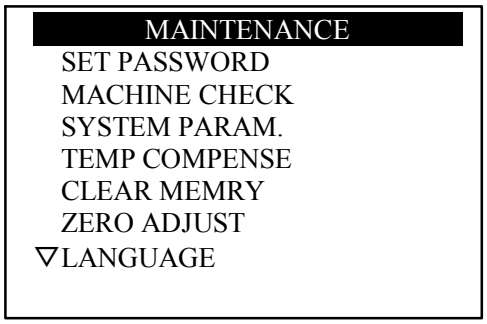
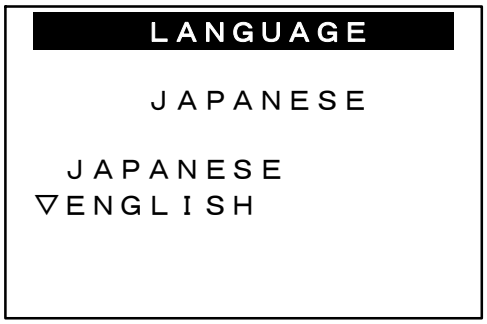
Procedure	Operation	LCD	Remarks
1) Select SET SYSTEM mode	Press the QUIT key to display MAIN MENU. Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT ▽SET SYSTEM LEVEL: 1	
2) Select REMOTE CONTROL	Move the cursor over REMOTE CONTROL and hit the ENTER key.	SET SYSTEM LCD CONTRAST DATE / TIME SET RS-232C SET FUNC. KEY SET MEASU. MODE ▽REMOTE CONTROL	
	Select ON or OFF by the cursor and hit the ENTER key.	REMOTE CONTROL CONTROL ON ▽ON OFF	Displays the present status.
3) Return to COMPO. MEASU. screen	Press the QUIT key twice. Move the cursor over COMPO. MEASURE and hit the ENTER key.	Returns to SET SYSTEM screen. Returns to MAIN MENU. Returns to COMPO. MEASU screen.	

9.5 Selecting the Language on the LCD (Operations on Level 2)

Select the language on the LCD screen, English or Japanese.

This operation needs to get in the maintenance mode on level 2, Do not operate other than selecting the language. All the other modes here are for the manufacturer to adjust.

Procedure	Operation	LCD	Remarks
1) Go to Level 2	Press the QUIT key to display MAIN MENU. Move the cursor over CHANGE LEVEL and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE ▽CHANGE LEVEL SAVE DATA RS-232C OUTPUT SET SYSTEM LEVEL: 0	
	Input the password for LEVEL 2 (99999) and hit the ENTER key.	PASSWORD CODE ﾄﾞ: 0 0 0 0 0 ROM : ＊ ＊ ＊ ＊ ＊ ＊ ＊ MODE : 4	ROM version is displayed. 3 stands for JE-130. 4 stands for JE-140.
2) Select SET SYSTEM	Move the cursor over SET SYSTEM and hit the ENTER key.	MAIN MENU COMPO. MEASURE PROG. A. CURVE CHANGE LEVEL SAVE DATA RS-232C OUTPUT ▽SET SYSTEM LEVEL: 2	
3) Select MAINTENANCE	Move the cursor over MAINTENANCE and hit the ENTER key.	SET SYSTEM LCD CONTRAST DATE / TIME SET RS-232C SET FUNC. KEY SET MEASU. MODE REMOTE CONTROL ▽MAINTENANCE	

Procedure	Operation	LCD	Remarks
4) Select LANGUAGE	Move the cursor over LANGUAGE and hit the ENTER key.		
5) Select the LANGUAGE	Move the cursor over ENGLISH or JAPANESE and hit the ENTER key.		i.g. Changing to ENGLISH
			i.g. Changing to JAPANSE
6) Return to MAIN MENU	Press the QUITE key twice. Move the cursor over COMPO. MEASU. and hit the ENTER key to return to MAIN MENU.	Returns to MAITENANCE screen. Returns to SET SYSTEM screen. Returns to MAIN MENU.	

Note: The password for Level 2 is 99999.

10. Error Messages and Correcting Errors

Here's a list of error messages and how to correct them.

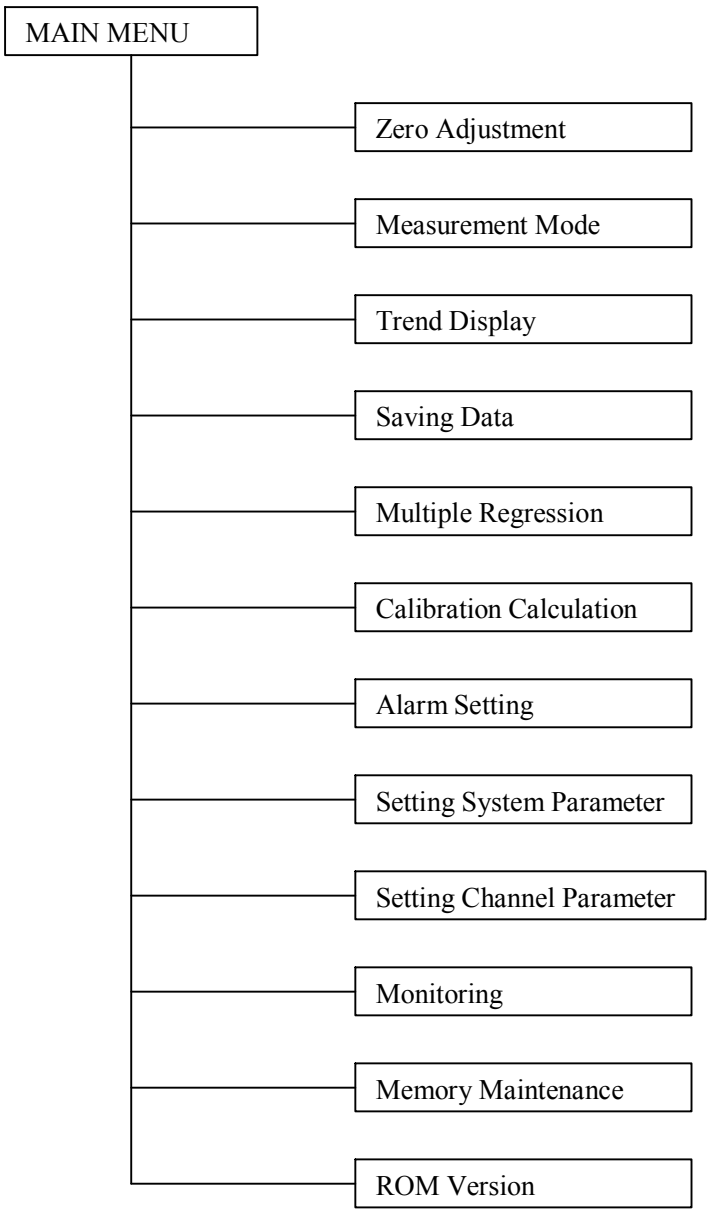
Error Message	Cause	Action
NO A.CURVE	No Analytical Curve is set for the channel currently used for the measurement.	Program the Analytical Curve for the channel
SAMPLE LOW REF	The reflectance of the sample is too low. The bulb is off. Other.	 Change the bulb. Call for repair.
ABNORMAL TEMP	The internal temperature of the analyzer is too low or too high.	Call the dealer.
BUFFER FULL	The saved data reached 99	Send to save the data in the PC and delete a part or all the data in the analyzer.
MEMORY ERROR	Abnormal data or the data partially or entirely damaged.	Call for repairs.
CALC. ERROR	Absorbance too large. (Overflow occurred during the calculation.)	Call for repairs.
CALIB. ERROR	Not enough data or inadequate data for the A. Curve calculation.	Check the data.
MOTOR ERROR	The motor rotation is slowing down or stopped.	Call for repairs.
SENSOR ERROR	The sensor circuits error.	Call for repairs.

CAUTION	Contact the dealer for repairs if the error message that needs repairs are displayed. Do not attempt to continue to use.

11. PC Software (Optional)

Overview of the optional PC software

11.1 Menu Structure of the PC Software



11.2 Overview of the Menu

Main Menu	Overview
Zero Adjustment	Performs the remote zero adjustment from the PC, and displays the absorbance changes in the graph and numeric data.
Measurement Mode	Imports the batch or continuous measurement data of the component values, absorbance and the internal temperature from the analyzer and displays on the PC monitor
Trend Display	Imports the data of the component values, absorbance and internal temperature and displays in a trend graph.
Data Save	Reads the saved data in the analyzer and displays them as lists or graphs.
Multiple Regression Analysis	Performs the multiple analysis with the imported or entered measurement data and display the result with numeric data and a graph.
Calibration Calculation	Imports the saved data from the analyzer and performs the multiple regression analysis. The calculation result will be displayed and exported to the analyzer.
Alarm Setting	Sets the internal high and low temperature limit alarm.
Setting System Parameter	Imports and exports the system parameters of the analyzer.
Setting Channel Parameter	Imports and exports the channel parameters of the analyzer.
Monitoring	Displays the error message, voltage and absorbance by real time.
Memory Maintenance	Initializes/ resets the analyzer memory error.
ROM Version	Displays the ROM version of the analyzer.

12 Optional Items

This is the list of optional items. Contact dealer for orders.

Item	Specification
Battery pack	NP-90
Battery Charger	AC Battery Charger
AC100V adaptor	Converts AC100V to DC6V
JT Mil	Rotary Cutter Type, AC 100V, 3 minutes standard
Printer	Micro thermal Printer BL-58RSII by *Sanei* Electric, Inc.
Printer Paper	
Printer Cable	For the analyzer and the printer communication
Printer AC adaptor	AC power cable
Hood	Hood extension (150mm)
Zero Adjustment Hood	Hood
	Zero adjustment Plate
RS communication cable	3130-6P-C (*Hirose* Electric Co., Ltd)←→D-SUB9 pins
JE-140 Software	Windows 2000or later
User's Manual	For JE-140/130 Analyzer
	For PC software

*Specifications are subjected to change without notice.

13. Specification

13.1 Analyzer

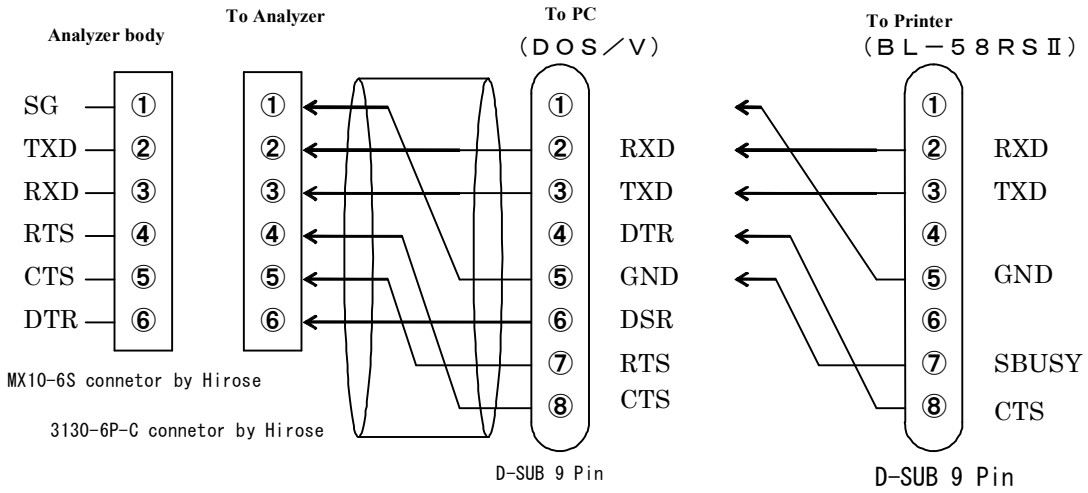
Make	Hand-held type NIR Analyzer JE-130, JE-140
Measurement system	Near-infrared ray reflectance system
Measurement distance	150±25mm (Verified with the built-in distance indicator beam, red LED being center in the measurement spot.)
Measurement spot diameter	Approx.25mmϕ (at 150mm distance)
Display	LCD (LED backlight)
Number of Analytical curves	50 channels
Measurement value display	Down to two decimal places
Smoothing	Smoothing value 0~5 (6 steps)
Refresh cycle	Calculation 0.2 second, Display 0.4 second
Adjustment function	Auto-Zero adjustment
Reproducibility	Within 0±0.003 (With the Zero adjustment plate)
External communications	RS-232C communication 1ch (for either PC or Printer)
Self-diagnostic function	Low reflectance, Motor rotation abnormal, Internal temperature (High, Low) No Analytical curve, Calculation error, RAM error, Calibration error, Buffer full, Sensor circuit error
Other functions	Password, Temp. compensation, Analytical Curve correction constants
Light source	Electric tungsten bulb 5V/ 1A
Ambient temperature	10~ 40 C (50~104 F)
Ambient humidity	10~80% HR without condensation
Installation	3/8in. Tripod bolt receiver
Power source	Battery pack 6V~7.5V AC 5V/2A
Body	ABS (paint finish)
Weight	Approx. 1.1kg without the battery pack

13.2 RS-232C Interface

Transmission format	RS-232C
Baud rate	1200, 2400, 4800, 9600
Parity	None, Odd, Even
Data length	7, 8
Stop bit	1, 2

Recommended plug 3130-6P-C (by Hirose Electric Co., Ltd)

13.3 Diagrams of Cable Connections with PC and Printer



13.4 Setting the Optional Printer

The recommended printer is “Micro Thermal printer BL-58RSII” by Sanei Electric, Inc. The printer paper is a seamless roll paper. Refer to the user’s manual of the printer for detail.

When you connect the analyzer with the printer, it is necessary to change the setting of the printer as follows:

- Data input = Serial
- International char = English
- Print mode = Alphabet
- Character set = 24Dot ANK Gothic type
- Select switch = Invalidity (OFF)
- Baud rate = 9600 bps
- Bit length = 8 bit
- Parity = Non
- Data control = SBUSY
- Paper selection = Normal paper
- Upright/inverted = Upright printing
- Auto power off = Available (ON, 90minutes)
  or Unavailable(OFF)

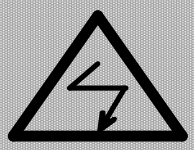
Check the underlined as they may be different from the default settings

Refer to the user’s manual of the printer for the operation to change the setting.

Note: If you set the select switch at Invalidity (OFF), the line always stays online.

Service Under Warranty

When you call for repairs:



If error messages are displayed on the analyzer or malfunctions are observed, you may need to call for repairs. Please read the following and take a good care for safety issues, especially electric hazards.

1. If one of the error messages is displayed:
   - Refer to the error code list of this manual, page 10-1.
   - Take a proper action except for calling for repairs are suggested.
   - Contact the dealer for repairs if the message requires a repair or if the malfunction has not been recovered after the suggested action taken.

     Do not continue to use the analyzer.
2. If malfunction is observed:
   - Contact the dealer and explain the status of the analyzer.

     Do not continue to use the analyzer as it may cause further malfunctions or accidents.
3. When you recognize that repairs are needed:

   You may need to send back the analyzer for repairs. Please follow the procedure below for safety reasons.

   1) Turn the power off of the instruments around the analyzer.

      -If an external device is connected to the analyzer turn it off.

   2) Turn the analyzer power off.

      -Turn the analyzer power off and disconnect the power plug.

   3) Remove the connected cable from the analyzer.

      -If there are any cables connected to the analyzer, remove them.

   4) Fill in the analyzer repair application form.

      -Take a photocopy of the “Repair Application Form” attached at the end of this manual and fill in accordingly.

   5) Pack up the analyzer to send.

      Do not dismantle the analyzer. Pack everything including the zero adjustment plate. If the situation is difficult to pack up, please contact the dealer. We strongly recommend to use the original packing materials of the analyzer. Contact the dealer if you need the materials.

   6) Ship the analyzer.

      We may advise the destination for efficiency. Please contact the dealer for the shipping destination.

Service Under Warranty

Recommendation for Overhaul

Although the measurement conditions differ in every site where the analyzer is used, we generally recommend the overhaul once in every other year.

Enquiry

Contact the dealer reception for enquiries on this product. See the list of dealers and agents at the end of this manual.

Repair Application Form

Date Written by _____

Take a photo copy of this page and fill below to report the malfunction in detail.

Please fax or post to the dealer.

Product	JE-140	Serial Number	
Product	JE-130	Serial Number	
Date of Purchase			
Error Message	E-( ) Not displayed		
Malfunction Status	Please describe in detail. Also please report if you notice anything other than the malfunction. i.g. The carrying case damaged.		
Ambient temp.	Approx. （ ～ ）C/F	Ambient humidity	Approx. (～ ）%RH
Used at	Factory / Room / Outdoor/ Other（ ）		
PC, if any	Product name （ ）Manufacturer（ ）		
Environment	Dust, Vibration, etc. if any		

Company Name	Phone & Fax and the name of the personnel for contact

Dealer	Remarks

16 Enquiry Receptions

○ JT-Engineering Inc.

	Place	Address	Tel.	Facsimile
Main Office	Tokyo	1-2-1 Shibaura, Minato-ku, Tokyo, Japan	03-5441-2203	03-5441-2200

○ Dealer/Agent

Dealer	Address	Tel.	Facsimile

○ Customer

Date of Purchase	
Dealer/Retailer	
	Tel.

○ Distributor

JT-Engineering Inc.
Postal code: 105-0023 1-2-1 Shibaura, Minato-ku, Tokyo, Japan Tel. 03-5441-2203 Fax. 03-5441-2200

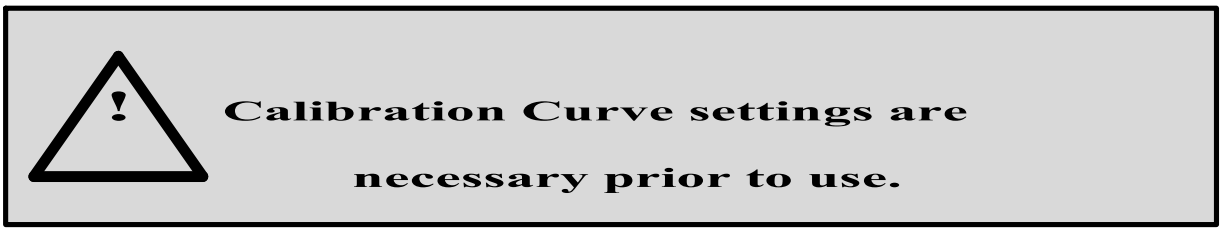
Preface

Thank you for purchasing our product, JE-140 Near-Infrared Analyzer.

Please read this manual thoroughly to make best use of it.

The objective of the analyzer

This analyzer applies Near-Infrared technology, which enables you to measure the sample component instantly and continuously. The analyzer calculates the components density of the sample in proportion to absorbance of near-infrared light.



Read this manual to set a proper analytical curve for the sample you are going to measure.

How to read this manual for JE-130

This manual is written for JE-140. However you can read it as JE-130 Manual. For JE-30, read the following two words as below:

JE-140 → JE-130

Component → Moisture

Additional articles are put in this manual where JE-140 and JE-130 differs and explanations are necessary.

JE-140 Handy Type NIR analyzer
JE-130 Handy Type NIR Moisture Meter

User's Manual

Ver.1.00

Published on 1st of April, 2005

Published by JT Engineering Inc.

Contents of this manual are subjected to change without notice.